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# ABSTRACTS OF TUBERCULOSIS

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**Principles of Diagnosis and Treatment of Tuberculosis.**—Timely and adequate treatment assures the tuberculous patient that he will have a 75 per cent, or more, chance of obtaining an arrest of the disease and continued judicious living will make the arrest permanent in most cases. Most medical men are pessimistic about the results of treatment and about their own ability to diagnose and treat the disease. The chief reason for the general failure to recognize the early symptoms and signs is not so much a lack of ability, but because physicians do not take sufficient time to examine and study the case and because they are looking for signs that are too gross. They can at least learn when to suspect tuberculosis and when to seek aid in diagnosis. They should recognize the universality of infection and the chronic and relapsing nature of the disease. Three causes operate to produce symptoms in early tuberculosis: (1) toxins acting through the nervous system and endocrine glands, influencing peripheral structures through the symphathetic nerves; (2) inflammation in the lungs producing reflex symptoms in other tissues; and (3) the local process giving rise to such symptoms as expectoration, pleurisy and hemoptysis. Tuberculosis should be suspected when the patient gives a history of being run down, accompanied by some of the following symptoms: loss of weight, hoarseness, cough, hemoptysis, pleurisy or frequent colds. Fever may or may not be present. A carefully taken clinical history will furnish data upon which a suspicion of tuberculosis may be based in nearly all instances of active disease. Under ideal conditions early tuberculosis yields to treatment in nearly all cases; most moderately advanced and a goodly number of far advanced cases become quiescent. Tuberculin, artificial pneumothorax and climate may be advantageous but they are subsidiary measures. Active tuberculosis requires three months or more of bed rest. A full but not excessive diet, rich in vitamines, is important. Exercise, when indicated, should be graduated. The virtue of open air lies in its effect on the delicate nerves of the skin. Heliotherapy is a valuable adjunct but is contraindicated in febrile cases. The physician must have a sincere and intelligent interest in the progress of the patient. Symptomatic medication may be helpful. All patients suffering from the chronic toxemia of tuberculosis have a certain degree of acidosis, causing a reduction of the free water of the body. To combat this, bicarbonate of soda and magnesium may be given by mouth, intravenously or by the Murphy drip, at the same time encouraging the drinking of large quantities of water. The Murphy drip seems to be the most practical method. A solution of from three to five per cent sodium bicarbonate is allowed to flow into the rectum, drop by drop, for three or four hours daily. This is continued for three or four weeks, discontinued for a few days, and then resumed. Patients sleep better, the appetite improves and the temperature frequently becomes gradually lower. The beneficial effect can be understood from the work of Fischer and Woodyatt and Sansum, showing the detrimental effect of a reduction of the free water of the body. In addition to treating the patient he should be instructed to avoid infecting others.—*Medicine's Duty Toward the Tuberculous Patient, F. M. Pottenger, N. York M. J., January 4, 1922, cxv, 14.*

**Diagnosis of Activity in Pulmonary Tuberculosis.**—Hemorrhage, fever and bacilli in the sputum are the classical symptoms of activity, and moist räles in

cases of the noncirrhotic variety are very much in favor of it. A uniform obscurity of the apices in the X-ray is suspicious and, soft circumscribed patches in considerable number are a definite sign of activity. Temperatures exceeding 37.5°C. and not resulting from mental or muscular exertion are pathological in man. In the female a rise of rectal temperature after a walk of an hour persisting for 30–45 minutes in spite of rest is in favor of activity. A focal reaction following a subcutaneous tuberculin test has not been confirmed as a pathognomonic sign of activity. A negative Pirquet reaction in incipient cases is against activity, while a relative and absolute lymphocytosis in the blood means activity. Absence of displacement of the polymorphonuclears to the left makes activity very slightly probable, while displacement to the left is no absolute sign of activity. The Wildbolz intracutaneous autogenous urine reaction, if confirmed, would constitute an important means of determining activity in pulmonary tuberculosis.—*Die Aktivitätsdiagnose der Lungentuberkulose, E. Fränkel, Deutsch. med. Wchnschr., March 3, 1921, xlvii, 235.*

**Diagnostic Sign in Early Pulmonary Tuberculosis.**—The so called classical physical signs of incipient pulmonary tuberculosis are not found in more than ten per cent of the cases. A sound that is not described in text books has been of value in diagnosing these early lesions. One who has used or heard the sound of a fine wood plane can appreciate the sound, which may vary in pitch between that of the wood plane on soft pine and a soft rasping. It may be continuous or alternating through the phase of inspiration, but is not usually heard on expiration. It is usually heard best in the second or third intercostal spaces anteriorly, on the affected side, between the sternal and midclavicular lines. The voice sounds are not affected. The abnormal sound is imitated by placing the lips and tongue in position to articulate the letter "T." Then make the sound "shlu" by taking a full slow inspiration in an undertone. This inspiratory sound may be continuous or interrupted so as to consist of one, two or three parts. Rarely it may consist of four parts. The intensity may vary. The variations in the sound are diagrammatically illustrated. In the presence of tachypnea, bradypnea or dyspnea, associated with bronchial asthma, the "shlu" sound may be diminished or obliterated. The sound has been confirmed in 90 per cent of the cases diagnosed with its aid as incipient pulmonary tuberculosis. Ordinary methods of inspection, thoracography, spirometry, palpation, mensuration, percussion, X-ray examination, examination of sputum and exploratory puncture may be of value in leading to a diagnosis or a differential diagnosis, but they are valueless in arriving at an exact early diagnosis of beginning tuberculosis.—*An Important Sign in the Diagnosis of Beginning Pulmonary Tuberculosis, W. F. Dutton, Med. Rec., February 4, 1922, ci, 189.*

**Special Stethoscope for Spinal Auscultation.**—Failure to elicit D'Espine's sign, in making the diagnosis of tuberculosis of the bronchial lymph nodes, may be due to a faulty stethoscope. The ordinary instrument has too flaring a bell. The author devised one with a bell made of maple, 24 mm. in dimaeter, which would fit over a single spinous process of a child's vertebra. With this stethoscope it is possible to clearly distinguish the pure tracheal tone on which the diagnosis of bronchial node tuberculosis depends.—*Das d'Espinesche Zeichen zur Diagnose der Bronchialtuberkulose im Kindesalter, K. Klare, Münch. Med. Wchnschr, September 16, 1921, lxviii, 1197.*

**Provoked Inequality of Pupils as a Diagnostic Sign of Tuberculosis.**—In pleuropulmonary affections, and especially in tuberculosis, there is very often an inequality of the pupils which may sometimes be apparent under ordinary conditions, and may sometimes be latent, requiring to be provoked by special means. The latent form may often come out in the dark, or in partial darkness, and should always be sought for by examination in the dark room, or it may have to be brought out by mydriatic or myotic drugs. Provoked pupillary inequality should be studied as a feature of every case of pulmonary tuberculosis. The demonstration may be made either by mydriatics which will provoke a more rapid and complete dilatation on the side of the tuberculous lesion, or by myotics which will provoke a more rapid and complete contraction of the opposite pupil. The pupillary sign is not invariable, but when it occurs it has great importance, ranking as one of three very early signs, the other two being pain on pressure at the apex, and subclavicular adenitis and lymphangitis. It may, besides having the value of an early sign, and of an indirect sign of localization, also have at times, the value of a sign of evolution. But in all cases its value should be estimated, not as that of a separate sign, but as a finding to be added to other signs of probability. A pupillary inequality has no diagnostic value unless all other causes of

inequality are excluded. These would include, among other things, all ocular troubles; but the existence of a "physiological" or "congenital" inequality of the pupils is not to be admitted without more evidence of it than has yet been offered. Satisfactory proof of such a "physiological" condition would exist only in the complete absence of all causes for inequality of pupils—causes which would include tuberculosis, as well as syphilis, and nervous and ocular troubles. This being the case, a diagnosis of "congenital pupillary inequality" could be formulated only after an exhaustive examination by all the means of detecting syphilis, tuberculosis, ocular disorders, etc. The apparent cause of the pupillary inequality in pleuropulmonary affections is a sensitization of the pupil on the side of the lesion, produced by irritation of the sympathetic, an irritation which, if not spontaneously manifest, may be artificially elicited. Four clinical varieties of this pupillary inequality are observed: 1. The pupillary inequality exists alone; there is no vasodilatation of ear or cheek vessels, and no sweating. In this variety it may be difficult to determine whether the trouble represents a spasmodic mydriasis of one side or a paralytic myosis of the other. These two states may be successive, depending on the age of the lesion: at first, irritation of the sympathetic by the pleuropulmonary lesion may cause dilatation of the corresponding pupil; later, if the lesion has become chronic, it may have destroyed the pupil-dilator fibres, and the pupil which was previously the larger has become the smaller one. This simple pupillary inequality is exaggerated in the dark room and is diminished or may even disappear in the light. This is just the opposite of inequalities symptomatic of lesions of the nerve centres, and is a reason why examination should always be made in the dark. This variety is common: of 64 patients in a ward, 14 showed it; all of the 14 had pleuropulmonary troubles, and 9 were tuberculous. 2. The pupil inequality has the associated symptoms of myosis on the side corresponding to the lesion, with narrowing of the palpebral opening and retraction of the eyeball. 3. The inequality is associated with the same symptoms plus vasomotor changes in the ear and cheek of the same side. 4. There are pupil dilatation and vasomotor changes, without the oculopalpebral syndrome. This variety is observed in subjects having old lesions, particularly in torpid tuberculosis with pleural and mediastinal signs. The vasomotor disturbances precede the pupil dilatation, sometimes by months or years. These varieties are the result of anatomic conditions related especially to the sympathetic: if, for example, the lesion destroys the pupil dilator fibres, a myosis is produced; that is, the second clinical variety is observed; if, at the same time, the sympathetic ganglion is destroyed, the oculopupillary and palpebral syndrome is produced; and, if the sympathetic trunk is also destroyed, vasodilatation of the ear and cheek vessels occurs. In the fourth variety, it seems that an adenopathy or a mediastinitis has destroyed the sympathetic trunk, provoking the vasomotor facial troubles; and, extending upward, the lesion involves the region of the pupil-dilator nerves, producing a pupil dilatation. The cause of the first variety is more in dispute; a reflex and a toxic infectious origin are claimed for it. But it seems, rather, that it also has an anatomic origin. Evidence that this is so is found in the following facts: This simple dilatation occurs in such disorders as penumonia and tuberculous pleurisy of the apex; when the lesion becomes chronic, dilatation gives place to homologous contraction, which exists alone, for a time, before becoming associated with other elements of the oculopalpebral syndrome, and which may even exist alone indefinitely if the lesion does not extend beyond the region of the pupil-dilator fibres. Finally, in subjects with tuberculous lesions, latent pupillary inequality may be demonstrated with drugs which excite or paralyze the sympathetic endings in the iris. The mydriatics used were atropine and cocaine; the myotics, eserine and pilocarpine. Whenever it was not contraindicated, atropine was preferred to cocaine because it produces mydriasis much more slowly, and, hence, there is less danger of overlooking the time, often very short, during which the inequality is apparent. Care must be taken to instil equal quantities of the drug into each conjunctival sac and to count only reactions where none of the drug is lost. The reaction begins, usually, in ten to twelve minutes and becomes complete in twenty to twenty-five minutes. It must be strictly watched for; for, when a pupil is not greatly sensitized, the difference in the reaction on the two sides might easily pass unperceived. A sensitized pupil begins earlier, and arrives sooner at its maximum dilatation, and loses its light and accommodation reflexes before the other. Recovery begins earlier and proceeds more rapidly in the nonsensitized pupil, so that there is a second period of inequality which may last for some days. An inequality provoked by mydriatics is of far greater importance as a test for early tuberculosis than one provoked by myotics. In fact, a lesion capable of producing an

homologous myosis is a lesion already so old that it ought to be demonstrable by the stethescope and the X-ray. Mydriatics and myotics may be employed successively, and should give concordant results; but sufficient time must elpase between the two tests. It sometimes happens that the same pupil reacts more vigorously to both reagents, or that it remains especially indifferent to both, which appears to indicate that a pupil may be in a state of absolute sensitization or inhibition. Pupillary inequality may occur under circumstances which make it valuable as a sign of the evolution of the disease. A provoked mydriasis sometimes occurs at the time of an hemoptysis, and disappears after the attack, in suspected subjects and in those with very slight physical signs, and also in patients with old distinct lesions. It fails oftener in subjects with old, fibrous, nonactive lesions than in subjects who have general and functional signs of probability and few or no definite physical signs. Cases occur where the pupil reaction appears on the side opposite the suspected lesion. This may lead to a revision of the diagnosis or to evidence of a bilateral lesion. Experience has shown that inequality of pupils cannot invariably be provoked in tuberculosis, but only when the pulmonary lesion exists in a region where it may affect the sympathetic fibres going to the pupil. Since an earlier communication (*E. Sergent, L'inégalité pupillaire provoquée et le diagnostic précoce de la tuberculose pulmonaire, Acad. de Méd., April 12, 1921*) there have been 109 new cases studied. Of these 19 were diagnosed as free from tuberculosis and 17 of these gave negative pupil reactions; of the 2 which gave positive reactions, 1 had been a suspect the previous year, and 1 had an old frontal sinusitis on the side of the pupil dilatation. Among 41 subjects with a confirmed unilateral lesion, 9 showed inequality of pupils before the test, and 32 showed none. In these 32, atropine or cocaine produced a positive reaction on the side of the lesion 24 times, 3 times on the opposite side, and 5 times the reaction was negative. The 5 negative cases had old, nonactive lesion; in the 3 in which the opposite pupil reacted, the lesions were also old, and, in one case, it could be shown by pilocarpine that there was a latent paralytic myosis on the side of the lesion. With the 9 cases which showed spontaneous pupillary inequality, the test with atropine accentuated the dilatation on the side where it was present—the side of the lesion—in 5 cases. In the other 4 the pupil on the side of the lesion dilated more slowly and feebly; in 2 of these cases the test with pilocarpine showed the existence of a paralytic myosis on the side of the lesion, and contradicted the appearance of a latent sensitization of the opposite pupil. There were 49 subjects with signs so slight that they were classed as suspects; 46 of these gave positive reactions on the side of the lesion; 3 gave positive reactions on the opposite side. Of these 3, 1 proved to have bilateral lesions, in 1 no lesion was demonstrated, and the remaining subject was a convalescent from pleurisy without apical signs. These figures show that the possibility of provoking an inequality of the pupils constitutes a means of information that should take its place among the recognized methods of exploration for signs of pleuropulmonary disease.—*L'inégalité pupillaire provoquée dans le diagnostic des affections pleuro-pulmonaire and spécialement de la tuberculose, E. Sergent, Périn and Alibert, Rev. d. l. Tuberc., October, 1921, ii, 327.*

**Abdominal Symptoms and Signs of Thoracic Disease.**—Cardiac and mediastinal lesions may give rise to abdominal symptoms, thus accounting for the frequency of the diagnosis of "acute indigestion" in these conditions. Differentiation of the underlying lesion may be exceedingly difficult especially when it is chronic and slowly progressive. In some cases the primary pathology causes little subjective disturbance, whereas a secondary condition, such as gastric or esophageal varices, gives rise to very definite symptoms. In other instances, symptoms of cardiac collapse, dilatation or rupture are actually induced by gastric defects. A careful physical examination of the mediastinal space is indicated in every instance of apparently acute inflammatory or hemorrhagic disease of the upper abdomen, and in chronic disease of this region a possible cardiac lesion should be considered. Acute pleurisies are quite regularly accompanied by abdominal signs and symptoms and are often confused with such conditions as acute appendicits and gall bladder lesions. The diagnosis is particularly difficult when the diaphragmatic pleura is affected. In some cases abdominal tenderness and rigidity may be elicited on the side opposite to the seat of the pleurisy and all the classical signs of peritoneal irritation may be present. Abdominal zones of Head hyperaesthsia may be present. Differential diagnosis is sometimes facilitated by the knowledge that in the pleural lesion respiration is more frequently accelerated than in the true abdominal lesion. This point is best determined when the patient is asleep. The signs and symptoms of chronic abdominal lesions may be simulated by chronic pleural inflammations, adhesions, or even neoplasms.

Fluoroscopy and radiography are valuable aids in making a proper diagnosis, but it must be remembered that in localized pleurisies and in some pneumonias X-ray densities are not detectable until a variable time after the initial symptoms have appeared. In order to avoid unnecessary hazards in such cases the practitioner should defer laparotomy until differentiation is possible. A rather extensive autopsy experience has shown that many cases of so called postoperative pneumonia were really initial pneumonia with predominating abdominal manifestations. Other lesions causing similar confusion include pulmonary infarct and lesions of the esophagus. Chronic ulcerative pulmonary tuberculosis is frequently characterized in its onset by gastrointestinal signs and symptoms. Usually there is no peritoneal or pleural involvement to account for this. The diagnosis is accomplished only by a complete physical or X-ray examination. The symptoms of pulmonary tuberculosis are so frequently confounded with those of abdominal lesions that it is a wise rule to postpone operation until a complete physical examination is made or until definite and certain physical lesions are discovered in the abdomen.—*The Abdominal Symptoms and Signs of Thoracic Disease, H. Brooks, Med. Rec., December 24, 1921, c, 1103.*

**Deviation of Trachea in Pulmonary Tuberculosis.**—In a patient supposed to have a cavity in the right lung, X-ray studies showed a marked deviation of the trachea to the right. A systematic investigation, radioscopic and radiographic, of 300 cases of chronic tuberculosis revealed ten instances of very marked deviation, six to the right and four to the left, accompanied by more or less deviation of the mediastinum. These deviations are due to retraction of bands of sclerosis, resulting either from pleural synechiae or from fibrosis developing about cavities and accompanied by adhesions to the parietal pleura.—*Les déviations de la trachée dans la tuberculose pulmonaire chronique, P. Armand-Delille, Hillemand, Lestocquoy and Mallet, Meeting, Société Médicale des Hôpitaux de Paris, December 2, 1921, reported in Le Prog. Méd., December 10, 1921, no. 50, 585.*

**Healing of Pulmonary Tuberculosis in X-ray Picture.**—Only roentgenograms taken under identical conditions are of value in judging the healing of pulmonary tuberculosis. In a series of advanced cases several plates were taken of one case under slightly different conditions. Dull shadows could be made to disappear, while others were intensified. For the elimination of these errors the author fixes to the plate a test band composed of metal, bone and leather pieces. Only those plates are compared with one another in which the test bands have exactly the same appearance. Even this method does not protect against all mistakes, since the X-ray tube cannot always be brought exactly in the same relative position to the test band located at the periphery. Unavoidable mistakes, furthermore, arise from the varying amount of blood circulating in the soft tissues of the thorax and from the quantitative changes in the bulk of the tissues present at different times of X-ray examinations.—*Zur Beurteilung von Heilungsvorgangen bei Lungentuberkulose im Röntgenbild, G. Liebermeister, Deutsch. med. Wchnschr., September 22, 1921, xlvii, 1128.*

**Hemoptysis and Its Treatment.**—The treatment of hemoptysis cannot be considered a creditable chapter in the book of medicine. In particular we should rejoice to lose the familiar faces of ergot, acetate of lead, tannic acid, perchloride of iron, *et hoc genus omne*—the children of false analogy and unsound reasoning. The source of hemoptysis has been the subject of much speculation. Certainly, bleeding from eroded or ruptured vessels or from a miliary aneurysm in the wall of a cavity is responsible for a proportion of the cases. Capillary bleeding under congestive stress cannot be ruled out; Niemeyer held that this may account for large hemorrhage, likening it to the abundant bleeding from capillaries in the nasal mucous membranes. Flick considers "mixed infection" as an important factor. Capillary bleeding may be parenchymatous or from the bronchial mucous membrane. Ruptured bronchial vessels may result in large hemoptyses, occasionally with fleshlike casts of the bronchi. A copious rush of dark-colored blood comes presumably from the pulmonary artery which carries unaerated blood. Steady bleeding in moderate quantities during a febrile exacerbation is probably of capillary origin. Dührssen makes a major division into initial hemoptysis and hemoptysis at later stages. Under the latter he includes (1) copious arterial bleeding in beginning of softening period; (2) arterial bleeding from cavities; (3) capillary bleeding from ulcerated bronchial mucous membrane or ulcerating cavity; and (4) capillary bleeding without ulcerative changes. *1. Initial hemoptysis:* This may be due to erosion or rupture of vessels in a tuberculous centre and may represent the commencement of the "open stage" of tuberculosis. Often tubercle bacilli ap-

pear in the sputum following the bleeding. More commonly we have to do here with a capillary oozing. Reiche found initial hemoptysis occurring in 9.2 per cent of 1952 cases of phthisis; it was twice as common in men as in women. It accounts for one-third of all cases of hemoptysis and often indicates a predisposition toward further bleedings. *2. Hemoptysis at later stages.* (a) Such cases with softening may have dangerous or fatal bleeding; these cases are febrile. (b) Arterial bleeding results from rupture of a pulmonary aneurysm in a cavity or of unobliterated twigs of the artery traversing the vomica. Direct fatalities are not common and the dangers of aspiration pneumonia are more serious. (c) and (d): These include capillary bleeding from bronchial mucous membrane or cavity walls and perhaps parenchymatous bleeding. It probably includes the "congestive bleeding" of many authors. Under Milton's heading, "hemoptysis at any stage in plethoric subjects," may be included those cases associated with cardiovascular changes, full blood pressure and other conditions commonly summed up under the heading "gouty diathesis;" such cases may have considerable fibrosis, dry cavities and often bronchiectasis. Clark showed that the bleeding may result from peculiar vascular changes, amorphous and hyaline degeneration of the media and intima and small cell infiltration in the media of end arteries in the lung, apart from pulmonary tuberculosis; these changes are likened to those occurring in osteoarthritic joints. In 1907 Cornet suggested that secondary bacteria might be responsible for tendencies to hemorrhage in certain cases; lately, the occurrence of bronchopulmonary spirochetosis has seemed to justify this suggestion. v. Hösslin found that blood in cavities remains fluid, and Magnus-Alsleben that fresh tuberculous lung tissue delays or hinders clotting, while fresh normal tissue accelerates it greatly. The clotting power of a patient's blood may have much to do with his tendency to hemoptysis. After eating, the tissue fluids bearing the coagulation-increasing ferment (thrombokinase) may pass into the blood stream by osmosis; this may account for the greater tendency to hemorrhage in the early morning hours. The occurrence of hemoptysis at the menstrual period has been variously attributed to vasomotor and clotting power disturbances. Fever seems to have no influence on clotting power. Clotting power rises as hemoglobin falls. Observers have found a relationship between hemoptysis, humidity of the atmosphere, direction of wind and barometric movements. Weather alterations affect both blood pressure and coagulation power. Blood pressure alteration, especially after work and exercise, have been blamed for hemoptyses, but against this is the fact that most bleedings occur during sleep or rest. The assumed rise of pulmonary pressure consequent on a rise of systemic blood pressure has no basis in fact; there may be wide variations in the aortic pressure without any effect on the pulmonary pressure, unless the change is prolonged. Aside from this the amount of blood passing through the lungs must have some influence on pulmonary bleeding. This flow is subject to wide variations dependent on the distensibility of the lung and probably also on its poorly developed vasomotor nervous control, but the major factors are the supply of blood from the systemic circulation flowing into the right auricle, and the clearing of the left auricle. In view of these factors exercise must surely set up an increased circulation through the lungs and provide conditions favorable to hemoptysis. We can increase the pulmonary circulation by hastening the general blood flow but our means of diminishing this flow are less clearly adequate.—*Hemoptysis and Its Treatment*: *I. Classification and Source, C. Riviere, Tubercle, February, 1922, iii, 202.* (*To be continued.*)

**Hemoptysis and its Treatment** (*continued*).—The vasomotor action of adrenalin on the lung is a matter of disagreement; some have found a vasoconstriction following its use and others a vasodilatation. Frey found that the drug, like other causes of raised systemic pressure, tended to increase bleeding from a lung wound. Van der Velden found that adrenalin, given subcutaneously, raised the clotting power of the blood for two or three hours; the effect was less marked after mouth administration and absent after intravenous dosage. Atropine has been reported to have stopped large bleedings. Calcium salts increase the coagulability of the blood but when given by mouth may remain entirely unabsorbed. Hypodermic injection has caused sloughing of the skin and McDougal records two fatalities after intravenous administration; intramuscular administration, being free from these dangers, is preferable. The use of camphor cannot be said to rest on any basis above empiricism. Cardiac depressants, such as chloroform and pituitary extract, have been used for their effect in lowering pulmonary blood pressure. Similar action is probably obtained from depressant emetics although vomiting may be deleterious; ipecac, wine of antimony, apomorphine and emetine have been used,

and drugs of this class are also supposed to relieve congestion in tuberculous lungs. Digitalis has been used for its supposed constrictor effect on the pulmonary vessels but others have observed a vasodilatation; the drug has been shown to increase the coagulability of the blood. Ergot causes a rise in the pulmonary arterial pressure, attributed by some to vasoconstriction. Frey recorded no effect on a bleeding lung wound. The mode of action of gelatin is unknown; its injection (30 to 40 cc. of a 10 per cent solution) may cause pain, fever and headache, and its action is slow. Horse or beef serum has been given in 10 to 20 cc. doses subcutaneously. "Hemostyptics" such as hydrastis, hamamelis, liq. ferri, turpentine, lead acetate, tannin, etc., are usless and may even be harmful. The modern tendency with regard to narcotics in hemoptysis seems to be to delay their use in hemorrhages of large amount so that cough may be efficient in clearing the tubes; to avoid them as a routine measure, to give them only where milder measures have failed and they are needed as a nerve and vascular sedative, and to quiet excessive and useless cough; and to replace morphine by codein, heroin or dionin, or even by chloral. Pituitrin, alone among drugs, is said to lower the pulmonary pressure at the same time as it raises the systemic blood pressure; it has been given subcutaneously and intravenously. Common salt, given intravenously, acts by causing a hydremic plethora brought about by flow of tissue fluids, into the blood stream. Clotting power is thus reinforced because the tissue fluids carry thrombokinase, the activating agent. Four or 5 cc. of a 10 per cent solution warmed are given and may be repeated up to four times; if it fails, 15 per cent can be used. By mouth 5 to 10 gm. can be given. Where bromide seems indicated, 2 to 5 gm. of sodium bromide can be used to replace some of the salt in subsequent doses. Nitroglycerine and amyl nitrite cause a rise in pulmonary arterial pressure; Frey experienced slight increase of bleeding from a lung wound. Binding of the thighs and arms has been practised; the bandages are gradually loosened after half to three-quarters of an hour. The effect is due to a removal of a quantity of blood from the circulation and to the setting up, after their release, a flow of tissue fluid, and therewith thrombokinase, into the blood stream. Dry cupping of the abdomen causes a similar effect. In dogs it has been found that the lung vessels contract with the application of cold to the skin and dilate under the influence of surface heat; in practice the ice bag does not evoke much enthusiasm. Iced water in the stomach of dogs caused a dilatation of lung vessels and an increased volume of blood to the lung; hot water caused the opposite effect. Strapping of the chest and Penzoldt's sand bag have been employed by some. When artificial pneumothorax is indicated it should be given, if possible, between attacks of bleeding to avoid the risk of aspiration pneumonia. For permanent control of bleeding a fairly complete collapse is necessary.—*Hemoptysis and Its Treatment. II. Action of Drugs and Physical Measures, C. Riviere, Tubercle, March, 1922, iii, 241. (To be continued.)*

**Suspension Stability of Blood in Pulmonary Tuberculosis.**—The red corpuscle suspension stability was studied in 339 cases of uncomplicated human pulmonary tuberculosis. In many the tests were repeated at intervals up to ten months, and as many as 3000 tests were performed. Into a Record syringe of about 1.2 cc. capacity is drawn 0.2 cc. of sodium citrate (3.8 per cent), and enough blood from an arm vein to fill the syringe. The mixture is run into a reagent glass (2 cc.). To carry out the stability reaction this is then drawn into glass tubes of 2.5 mm. diameter, up to a mark at 200 mm. from the tip, which totals about 1 cc. to this point. After two and twenty-four hours in the vertical position the different layers, plasma and blood corpuscles, are measured. The rate of sedimentation is determined by gravity and in many pathological conditions a tendency to agglutination exists. As a whole, the grade of suspension stability agrees well in the majority of the cases with the advance of the tuberculosis. Slight variations in results may be occasioned by profuse sweating and extreme bodily exercise. Normal sedimenting speeds range about 2 mm., uncertain values are about 5 mm., and distinctly pathological, 10 mm. per hour. As a result of tabulating the findings in the various stages and activity, it appears that the suspension stability of the blood in pulmonary tuberculosis parallels the activity of the process. Acute cases give the most marked reaction while the chronic cases give relatively milder reactions, agreeing well, however, in intensity with the clinical findings. The stability can be markedly diminished even in the absence of temperature elevation; but it appears to be a much more reliable measure of the activity of the tuberculous process than the temperature. The stability reaction may possibly be of diagnostic value if other conditions causing the same changes, such as infectious diseases, pregnancy, nephroses and nephritis, syphilis, certain forms of rheumatism,

hemic diseases, etc. (the author does not complete the list), can be excluded. Prognostically the test can also be of value: It also seems that the test can be of value in estimating the action of tuberculin. An increase in the globulin or fibrinogen fractions (or of both) of the plasma occasions the diminished suspension stability of the blood. The relative number of blood corpuscles, although not appearing to be of significance, must be further studied.—*Über die Suspensionsstabilität des Blutes bei Lungentuberkulose, A. Westergren, Beitr. z. Klin. d. Tuberk., January 10, 1921, xlvi, 285.*

**Roentgenographic Diagnosis of Pulmonary Tuberculosis.**—Stereoscopic lung plates are the most valuable method of diagnosis. All other methods are secondary in value. Interpretation of the roentgenograms should be made independent of the clinical findings in the case. Necropsies on tuberculous subjects will aid in correlating densities in the roentgenogram with actual lesions in the lungs.—*Roentgen Rays in Diagnosis of Pulmonary Tuberculosis, J. D. MacRae, Meeting Southern Med. Ass., November 14–17, 1921, reported in J. Am. M. Ass., December 24, 1921, lxxvii, 2086.*

**Asynchronism of Respiratory Movements.**—In severe cases of lobar pneumonia it has been noticed that diaphragmatic and thoracic breathing may become dissociated. First the abdomen protrudes with the descent of the diaphragm and, after an interval of varying length, the intercostal muscles start to contract. This contraction begins in the lower intercostals and proceeds in a wave-like manner from below upward. In the fully developed type of asynchronism the diaphragm reaches the expiratory phase before the contractions of the intercostals set in, and the abdomen and chest rise and fall alternately—"seesaw" best describes the impression conveyed. This asynchronism may be due to an unequal depression of the bulbar (formatio reticularis) or other centres by the pneumococcus toxin. Hoover questioned the accuracy of the observations and suggested that the phenomenon is actually a retraction of the median portions of the upper ribs and sternum caused by some conflicting agent that overcomes the activating force of the intercostals. Tracings are presented to substantiate the correctness of the original observations and to answer Hoover's criticisms.—*Asynchronism of the Respiratory Movements in Lobar Pneumonia, W. Coleman, J. Am. M. Ass., January 7, 1922, lxxviii, 31.*

**Complement Fixation in Ocular Tuberculosis.**—An attempt was made to learn if the complement fixation reaction, with the antigen of Besredka, could demonstrate the tuberculous nature of ocular disease in the absence of other active tuberculosis. Three groups were considered. In the first, made up of individuals with a previous history of lung, lymph node or bone tuberculosis, reactions were obtained as follows: 4 cases of keratoiritis, 2 positive; 3 cases of iridocyclitis, 2 positive; 2 cases of uveitis, both positive; one case of subacute glaucoma, positive. In the second group, chiefly children with the stigmata of lymphatic tuberculosis and affected with keratoconjunctivitis, five out of seven reacted positively. The third group consisted of cases where present or past tuberculosis of other organs was not known or suspected, and where the eye affection was apparently primary. Out of three cases of keratoiritis 2 gave positive reactions; of 3 cases of keratoiritis 1 reacted positively; 1 case of uveitis gave a negative reaction; and of 4 cases of glaucoma 1 reacted positively. The reaction is believed to be of value in making or confirming a diagnosis of the tuberculous nature of the various eye lesions enumerated, and to be especially useful in keratoiritis and iridocyclitis.—*La méthode de la déviation du complement appliquée au diagnostic de la tuberculose oculaire, L. Carrère. Comp. Rend d. Soc. Biol., October 22, 1921, lxxxv, 696.*

**New Biological Methods of Diagnosis of Tuberculosis.**—Ten nontuberculous and 53 tuberculous children were studied. The intracutaneous test with the patient's own urine was found to be absolutely specific. The original technique of Wildbolz has been modified by Nasso as follows: 100 cc. of urine are evaporated in a large basin at 60° to 65°C. for three or four hours, to reduce it to one-tenth its original volume. The salts adhere to the basin. Two or three drops are injected intracutaneously. A similar test with the patient's own blood serum (evaporated to one tenth in a watch-glass) proved valuable in revealing the presence of a focus of active tuberculosis. Twenty-six children were tested in this way. Though the resulting reaction was not quite so marked as with the urine test, pain and necrosis never occurred. On this account, Nasso considers the serum test preferable.—*Sui nuovi metodi di diagnosi della tuberculosi mediante la ricerca degli antigeni, I. Nasso, Pediatria, August 1, 1921, xxix 690.*

**Theory of Tuberculin Reaction.**—Tuberculin does not act directly as a toxin but activates the toxins derived from tuberculous foci. Only the activated toxin is injurious to the cells and produces inflammation. Therefore there results no reaction in healthy persons following tuberculin administration; and there is no relation between a positive reaction and antibody formation, because the latter's origin is from the complete, efficacious virus. The toxicity of tuberculin Rosenbach has been reduced by planting trichophyton on the medium, which at the same time does not diminish its immunizing qualities.—*Die Tuberkulinreaktion, Rosenbach, Deutsch. med. Wchnschr., December 29, 1921, xlvii, 1581.*

**Effects of Tuberculin.**—The experiments of Römer and the phenomenon of Koch are discussed as to their bearing on immunity in tuberculosis. Koch's phenomenon is probably a manifestation of hypersensitiveness, while Römer's findings suggest that he produced a real immunity in animals. It is possible that the reinfection of animals, according to the method of Koch, may not result in a typical tuberculous wound, because many of the bacilli are carried away in the necrotic slough that appears at the point of infection. To determine this point tubercle bacilli were injected into animals intracutaneously in combination with diphtheria toxin; the toxin caused focal necrosis but the final result of the tuberculosis was not altered. By injections of tuberculin in combination with tubercle bacilli into tuberculous guinea pigs the results were no better. It has not been proved that tubercle bacilli are able to form a genuine toxin capable of producing a neutralizing antitoxin when introduced into the organism. It has not been possible to neutralize the effects of tuberculin by incubating it with serum from tuberculous men and animals. To study the fate of tuberculin in the organism it was injected intravenously or intraperitoneally into normal rabbits and guinea pigs; after varying intervals the animals were bled or killed and the serum was injected into the skin of tuberculous animals or was used on a very sensitive human skin for the Pirquet test. It was found that tuberculin circulates in the blood immediately after injection into the vascular system but it rapidly disappears thereafter. In another experiment, tuberculin disappeared from the peritoneal cavity rapidly and completely. Since Franceschelli showed that the total quantity of injected tuberculin cannot be found in the urine till after a lapse of several hours, it is assumed that the substance must be stored some place outside the vascular system, since blood neither *in vitro* nor *in vivo* was found to bind tuberculin. Likewise, extract of fresh ox liver showed no power of fixing tuberculin. However, it is bound by living cells *in vitro*, as shown by using liver and brain substances; by boiling, the combination is easily broken up. Tuberculin, three hours after injection into rabbits and guinea pigs, could not be detected in the lungs, kidneys, spleen or bowel contents. To determine this the organs were ground and boiled with water and the filtered decoction was steamed down and pure alcohol was added. The precipitate was dissolved in water and injected into tuberculous guinea pigs. Extracts of liver, prepared in this way, gave a slight necrosis after injection. Extracts from bones gave a distinct reaction; from muscles none. The reactions were always weaker than those from pure tuberculin. Controls were negative. It is concluded that the reaction which takes place *in vitro* by the binding of tuberculin in living tissue to a certain extent may take place also *in vivo*, and that the binding here is mainly effected by the bones. The circumstance that tuberculin cannot be quantitatively recovered in the body after injection possibly means that the tuberculin now forms a new combination which we cannot detect by our methods. This may also explain why we have not been able to find tuberculin in the tuberculous organism. Not until we obtain certain knowledge regarding the fate of tuberculin in the organism shall we be able to determine whether it is a true product of the tubercle bacilli or an artefact formed by the decomposition of the real toxin.—*Studies on the Effects of Tuberculin, P. M. Holst, Tubercle, March, 1922, iii, 249.*

**Diagnostic Tuberculins.**—The article warns against the use of preparations of old tuberculins of uncertain origin. The author detected a preparation sold by a Berlin pharmacist which contained only 25 per cent tuberculin and in consequence gave many false negative reactions. He recommends Moro's diagnostic tuberculin or the preparation of old tuberculin put out by Höchst.—*Zur Verwendbarkeit diagnostischer Tuberculine, E. Diehl, Münch. med. Wchnchr., October 28, 1921, 1392.*

**Simplified Cutaneous Tuberculin Test.**—For ten years in orthopedic practice Brandes has used the following method with good success. It consists in simply rubbing the skin with a small quantity of kieselgur until definite redness appears. On this spot a drop of undiluted tuberculin is placed, which is rubbed in with the forefinger

Miliary, confluent and vesicular types of reaction appear after nine to twenty-four hours, or at least after forty-eight hours. The method is simple and it is especially useful with children, as they are not frightened by the sight of an instrument.—*Zur Vereinfachung der kutanen Tuberkulinprobe, M. Brandes, Münch. med. Wchnschr., October 28, 1921, lxvii, 1392.*

**Cutituberculin.**—The source of tuberculin from human or bovine tubercle bacilli is of no consequence for the tuberculin reaction, provided both contain the same amount of toxin. The skin reactivity in underfed tuberculous guinea pigs was found to be markedly less than that in normally nourished controls. These results confirm Bloch's and Rominger's findings. In order to avoid errors due to this diminished reactivity in the underfed, a substance containing more skin reagins was prepared. This preparation, also capable of inducing reactions in the above mentioned refractory cases, is termed *cutituberculin*. Its subcutaneous administration is not advisable because of its increased tendency to produce a general reaction. For determining the strength of *cutituberculin*, the intracutaneous method of Römer and Joseph on the tuberculous guinea pig was used. It was found to contain five times the amount of skin reagins found in the standardized official tuberculin.—*Über das Cutituberculin und seine intracutane Auswertung, K. Joseph, Deutsch. med. Wchnschr., August 11, 1921, xlvii, 920.*

**Cutaneous Tuberculin Reaction.**—Three hundred children, from one to fourteen years, with symptoms suggestive of tuberculosis (anemia, weakness, recurring bronchitis, fever, swelling of lymph nodes, were tested. The reaction was carried out at 2 places with O. T., Höchst, and on correspnding areas with bovine tuberculin, Höchst. Instead of Pirquet's borer, a small anteriorly pointed inoculation lancet was used, which always makes certain the entrance of a small amount of tuberculin into the skin. In contradistinction to Synwoldt's findings, the established superiority of O. T. was confirmed; 5 per cent of the cases reacted only to bovine tuberculin, which represents a diagnostic increase, in view of the fact that 30 per cent did not react at all, or at least not definitely, to O. T. Those children reacting primarily only to bovine tuberculin, as well as the remaining negative cases, gave a positive reaction after the second or repeated inoculations with O. T., which was even more intense than to B. T. Later a specific difference between O. T. and B. T. was not noted at all. A positive reaction to B. T., therefore, does not mean infection with bovine bacilli. Synwoldt's conclusions are not justified. The prevalence of the B. T. reaction in the material studied by the latter author may be explained as due to the varying character of the tuberculins derived from different sources, as was proved by Moro. Moro's diagnostic tuberculin was tested on 70 children and no superiority to O. T., Höchst, could be noted. The greatest number of positive reactions will be obtained by using a pointed lancet and a well-tested tuberculin, and by combining the second O. T. inoculation with a B. T. test, in case the first O. T. test is negative.—*Zur Technik der kutanen Tuberkulinreaction. (Perlsucht und Moro's "diagnostisches" Tuberkulin, A. Lippmann, Deutsch. med. Wchnschr., November 17, 1921, xlvii, 1390.*

**Augmenting Effect of Adrenalin on Tuberculin Reaction.**—The addition of one drop of 1:1000 adrenalin solution to one drop of tuberculin increases markedly the intensity of the tuberculin skin reaction. Where tuberculin alone causes merely erythema, tuberculin plus adrenalin produces pustule formation and diffuse edema. In a tuberculous patient tolerating a given dose or tuberculin without reaction, the addition of adrenalin to the same dose may bring about a severe focal and general reaction. On the other hand the addition of quinine decreases the intensity of the tuberculin reaction and inhibits the effect of adrenalin on tuberculin. Antipyrine and pyramidon have a similar though less marked effect.—*Augmentation considérable des réactions à la tuberculine par addition d'adrénaline et action antagoniste de la quinine et d'autres substances, A. Bourveyron, Comp. Rend. d. Soc. Biol., November 12, 1921, lxxxv, 834.*

**Action of Ovarian Products on Tuberculin Skin Reaction.**—Although the tuberculin skin test is regularly more intense during menstruation, extracts of ovarian tissue, either stroma or corpus luteum, when mixed with tuberculin, prevent the development of the tuberculin skin reaction in tuberculous patients of either sex.—*Action de produits ovariens sur les cutiréactions à la tuberculine, A. Bouveyron, Comp. Rend. d. Soc. Biol., November 12, 1921, lxxxv, 836.*

**Comparison of Old Tuberculin with Moro's Diagnostic Tuberculin.**—Comparative tests were made upon 245 children. A drop of Koch's old tuberculin (Merck or Höchst) and one of Moro's diagnostic

tuberculin were placed upon the flexor surface of the forearm of each child with a sterile Pirquet borer; and the skin scarified in the usual manner. The sterility of the tuberculin solution was carefully controlled. Of these 245 children from two to fourteen years of age, 126 showed positive reactions. Merck's old tuberculin gave 30 per cent positive reactions, Höchst's old tuberculin 75 per cent, and Moro's diagnostic tuberculin 98 per cent. Not only were the number of positives much greater with the Moro preparation but these reactions were much more definite, the erythema, induration, etc., being much larger in area and intensity. The author therefore concludes that Moro's tuberculin is of much greater value and he states that its potency is constant at all times.—*Vergleichende Untersuchungen über die Zuverlässigkeit der Kochschen Alt-Tuberkulins und der diagnostischen Tuberkulins nach Moro, L. Meyer, Münch. med. Wchnschr., October 7, 1921, lxviii, 1286.*

**Diagnostic Value of Partigens in Dermatology.**—The partigen method is of diagnostic value in dermatology. It is more sensitive than the Pirquet test, but is not quite as efficient as the intracutaneous reaction with large tuberculin doses. In definite cases of skin tuberculosis, the antibodies to *A*, *F* and *N* were fairly equally developed. Among 36 lupus erythematosus cases, there were 8 that did not react to the partigens. The relatively high percentage of reactions would tend to associate lupus erythematosus with tuberculosis. In lupus erythermatosus the antibodies seem to be developed strongest to *N* and weakest to *A*. The weaker the inflammatory reaction of lupus erythematosus nodules, the less is the immunity developed. Cases with a negtive reaction to partigen inoculations are the most favorable for local therapy. Markedly reacting cases are not suitable for local therapy. Histologically, typical tuberculoid tissue masses can form at the inoculation sites. The most striking similarity to a tuberculous formation is revealed by the *N* papule; a difference between the *N* and the *A* and *F* papule is only discernible as regards the intensity of the reaction.—*Über die diagnostische Verwertbarkeit der Partigenmethode in der Dermatologie und den histologischen Aufbau der Partigenimpfpapel, L. Arzt and L. Kumer, Beitr. z. Klin. d. Tuberk., April 11, 1921, xlvii, 193.*

**Holländer Tuberculin Serum Reaction**—This test, which was purported to be of prognostic value, consists of overlaying 0.5 cc. of the patient's serum (taken while fasting) with 0.5 cc. of a 10 per cent solution of old tuberculin. A positive reaction becomes apparent after twenty-four hours in the incubator, as a cloudiness at the point of contact. Such a result indicates an immunity against tuberculosis. The authors have repeated Holländer's work and have come to the following conclusions: Holländer's serum test with tuberculin is a failire, for glycerine, glycerine broth, distilled water, sodium chloride and ammonium sulphate solutions likewise give similar reactions; the test is therefore nonspecific. Its results parallel those of the Klausner reaction (globulin precipitation from the serum by the addition of distilled water), and it is evidently concerned with the physical state of the globulin and the lipoid content of the serum. The test has no significance as to prognosis in tuberculosis. The parenteral introduction of collargol (possibly a protective colloid) or of caseoses can change the outcome of the test.—*Über die Schichtprobe des Serum mit Tuberkulin nach Holländer, E. Gabbe and W. Martins, Münch. med. Wchnschr., October 7, 1921, lxviii, 1285.*

**Partigens in the Urine.**—Specific antigenic substances are excreted in the urine in active tuberculosis. The definite determination of specific substances by the intracutaneous test can only be carried out by a careful observance of the partigen technique and by carrying out the autogenous urine test with a test of the hypersensitiveness of the body toward the individual partigens. A test with tuberculin does not give an insight into the immunity status of the body toward the individual partigens excreted in the urine. The reaction seems to be of value in determining the activity of a tuberculous process. It is possible that healthy persons who have adundant opportunity to take up tuberculosis antigens may excrete them in the urine. In one case dialysis seemed to increase the concentration of specific substances.—*Über die im Harne ausgeschiedenen Tuberkelbazillenpartigene und intrakutane Eigenharnreaktion, V. Čepulič, Beitr. z. Klin. d. Tuberk., February 10, 1921, xlvi, 435.*

**The Wildbolz Reaction.**—The intracutaneous urine reaction cannot be relied upon, either for precise and invariable diagnostic or prognostic information. Its inadequacy is due to several circumstances: 1. It is at times extremely difficult to read the results; all intermediate conditions between the frankly positive and the frankly negative occur; frequently even trained observers hesitate whether to call a reaction

positive or negative, and this difficulty introduces a personal equation into many cases. 2. The urine of persons who are undoubtedly not tuberculous may give the Wildbolz reaction; a result which has been verified by autopsy in some cases. The most intense reaction was produced by urine from patients with catarrhal jaundice. Treatment with salicylates or with valerian bases seems to make the urine react positively. The urine of a simple neuropath, of a patient with aortic insufficiency, of one with gonorrheal rheumatism, and of one with a purulent interlobar pneumococcic pleurisy all gave positive reactions. It seems impossible to distinguish between cutaneous irritation produced by tuberculosis antigen and other toxic substances. 3. The reactions obtained are determined not only by the quality of the urine but by the subject injected: some urines react either positively or negatively with all subjects, but some react either positively, negatively, or doubtfully upon a series of subjects all of whom react to tuberculin. In one series of eight injections a concentrated urine was positive three times, negative twice, and doubtful three times. Another urine taken at the end of an exacerbation from a patient with cavity gave six positive (one auto), one negative, and two doubtful reactions. Some subjects are particularly sensitive, others particularly resistant. Thus, a patient with aortic insufficiency reacted positively to his own and three tuberculous urines. Another patient with a serofibrinous pleurisy in eolvution reacted negatively to three tuberculous and one nephritic urine. The discordances and irregularities of the response which pertain to the inoculated subject have hitherto been overlooked, attention having been concentrated on the reaction. The presence of antigens in the urine of the tuberculous, though of real scientific interest, appears to be without practical importance as giving rise to an intracutaneous reaction for the detection of tuberculosis. The factors which enter into the reaction are too complex, variable, and imperfectly known. The reaction can neither serve as a means of diagnosis, nor as a sign by which we may measure the evolution of the disease.—*Étude critique de l'uro-intradermo-reaction de Wildbolz, F. Bezançon and M. P. Weil, Rev. d. l. Tuberc., October, 1921, ii, 319.*

**Wildbolz's Auto-Urine Reaction for Diagnosis of Activity in Tuberculosis.**—As a result of tests carried out on men and guinea pigs with urine from healthy persons diluted with tuberculin and with urine of definitely active tuberculous and tuberculosis-free patients, the following conclusions are drawn: Wildbolz's auto-urine reaction may be obtained with the urine of both tuberculous and healthy persons and is due to the traumatic and chemical action of the injected concentrated urine. The test, therefore, cannot be used for diagnostic purposes. Further investigations will show, however, whether the urine of tuberculous patients contains substances which can be utilized for diagnosis after the elimination of the urinary salt action.—*Zur Bedeutung der Wildbolz'schen Eigenharnreaction für die Aktivitätsdiagnose der Tuberkulose, G. Farago and P. Randl, Deutsch. med. Wchnschr., August 11, 1921, xlvii, 919.*

**Abderhalden Reaction in Scrofula.**—The biochemical reaction of Abderhalden is a valuable supplement to the biological tests in tuberculosis. Children of scrofulous constitution (5–13 years) were tested for protective ferments originating from the destruction of tubercle bacilli and tissue. There were three groups: 1. Children with definite scrofulosis, positive Pirquet and positive ferment reaction. These children were seriously ill. 2. Children suggestive of tuberculosis with negative Pirquet. Postitive serum findings led to definite diagnoses. 3. Children with absence of definite clinical findings, positive Pirquet, and negative serum reactions. The disproportion between the intensity of the Pirquet test and the serum reaction, as well as the presence of an allergic reaction in group 3, in spite of negative ferment reaction, are due to the fact, that fermentative processes begin and end earlier than allergy.—*Über Tuberkulbazillenabbau bei skrofuloser Konstitution, H. Jastrowitz, Deutsch. med. Wchnschr., May 12, 1921, xlvii, 528.*

**Diagnosis of Pneumokonioses.**—After a complete discussion of the various types of pneumokonioses with the concomitant findings and their characteristic differential points, the differential diagnosis of this condition from emphysema and bronchiectasis of other origins, chronic interstitial pneumonia, malignant pulmonary tumors (primary and secondary), pulmonary syphilis and, finally and most important, pulmonary tuberculosis, which may also exist coincidently, is given in great detail. For a consideration of the differential diagnosis from various types of pulmonary tuberculosis the protocols of a few interesting cases are cited. (*Abstractor's note*: The article is too exhaustive and full of detailed points to be suitable for complete abstracting.)—*Zur diagnose der Pneumokoniosen, M. Klehmet, Beitr. z. Klin. d. Tuberk., October 23, 1920, xlvi, 153.*

**Tuberculosis of Lymphatic System.**—The part played by the lymphatic system in the early spread of tuberculosis requires to be emphasized. Patients should be examined with this in mind, and the more important groups of nodes should be examined systematically. In cases of general deficiency all the readily accessible lymph nodes should be carefully investigated. In young children the lymphatic system should be investigated with special care from time to time. Lymphatic tuberculosis, conspicuous in children, becomes less marked in later life. In cases of gross enlargement of one or more nodes exacting search should be made into the state of adjacent nodes and other groups. Operative treatment should be limited to emergencies; for example, the immediate removal of a deformity in certain cases, or the evacuation of an obviously softened node. Save in exceptional cases, such operative treatment should not involve extensive incision. Operative treatment should not be regarded as radical. Tuberculous involvement of the lymphatic system can be effectively combated by continuous vaccine therapy.—*An Address on Tuberculosis of the Lymphatic System, R. Philip, Brit. M. J., January 28, 1922, no. 3187, 129.*

**Surgical Treatment of Tuberculous Cervical Adenitis.**—Of 132 cases of tuberculous cervical adenitis treated surgically, over a period of five years, 46 could be traced. Of these, 19, or 43.4 per cent, were classed as excellent results without disability or recurrence. In 12 cases, or 26.08 per cent, there was evidence of paralysis of the trapezius muscle from interruption of the conductivity of the spinal accessory nerve or the third and fourth cervical nerves. Two cases reported sinuses draining over a year. Five cases showed a paralysis of the depressor anguli oris muscle; none experienced any disability from this lesion. Two died since operation, one of pulmonary tuberculosis, the other of "intestinal trouble." Tenderness over the scar was marked in one case in which there had been a complete dissection of the neck. In only eight cases did lymph nodes persist after operation. The problem of the treatment of tuberculous cervical adenitis is not a settled one. "Bloc dissections" result in nerve paralyses and are seldom used now. Hygiene, X-ray and tuberculin treatment are not all that might be desired. In certain cases complete neck dissections are necessary. If prompt and active treatment could be instituted and adhered to in cases as soon as they manifest this condition, together with adequate attention to unsatisfactory conditions of tonsils or teeth, and also to other contributory factors, radical surgical measures would rarely be necessary. X-ray therapy has a very distinct place in managing this condition, not only as regards the firm, non-necrotic nodes, but also for the closure of the tuberculous sinuses which have resulted from the drainage of the liquefied ones. Surgery should not be resorted to until X-ray therapy has beeen tried for a considerable period of time—from six months to a year—provided the disease is not spreading and involving the adjacent nodes.—*End Results of the Surgical Treatment of 48 Cases of Tuberculous Cervical Adenitis, F. H. Lahey and H. M. Clute, Boston M. & S. J., March 2, 1922, clxxxvi, 280.*

**Tuberculous Headache.**—It is now realized that there may exist a simple serous meningitis of tuberculous origin, apparently an abortive form of basilar meningitis which sets up adhesions and obstructs the exit of the liquor from the cranial cavity. This affection is manifested by a headache of a neurasthenic or migrainous type. The patient usually presents a benign form of pulmonary tuberculosis. There is increased endocranial tension which, according to Frisch and Schuler (*Wiener klinische Wochenschrift*, December 15, 1921, xxxiv., 50), may be recognized by the X-ray. Lumbar punctates may be normal or may exhibit high pressure, pleocytosis, and increased albumin. In this case the process is acute and the X-ray negative, while in that of negative punctate and positive X-ray the condition may be regarded as chronic. In addition to direct attack by bacilli and the consequences of adhesion formation, the tubercle toxins are accused in connection with this type of meningitis. While bacilli have not yet been discovered in punctates the latter fluid has produced positive inoculation. In regard to the positive X-ray finds these apparently consist of accentuated *impressiones digitatae* on the inner aspect of the skull, as indicative of increased endocranial tension due to the acquired hydrocephalus internus. Since the same finding has been noted in typical migraine the latter may be suspected of having a paratuberculous nature. Serous tuberculous meningitis manifested as headache may be placed in part under tuberculous absorption lesions, such as are seen in various other organs.—*Editorial Note, Med. Rec., January 28, 1922, ci, 158.*

**Asthenopia with Tuberculosis.**—The asthenopic symptoms in the author's series of 184 cases in tuberculous ex-soldiers were hyperopic astigmia in 48.6 per cent, muscle imbalance in 48.3 per cent and frontal head-

ache in 102 cases, blurring vision for close work in 36.4 per cent, pain in the eyes in 27.1 per cent, inflammation in 19 per cent, burning and itching in 15.7 per cent, epiphora in 11.9 per cent, photophobia in 9.2 per cent, tired feeling in 7.6 per cent, simple hyperopia in 7 per cent, dizziness in 3.8 per cent, poor distant vision in 3.2 per cent, twitching of lids in 3.2 per cent, simple myopia in 1 per cent, and hordeola in 2.1 per cent. The careful refraction of all tuberculous patients is urged. In none of the 184 cases was any pathological condition found to account for the symptoms.—*Asthenopia with Tuberculosis, A. C. Magruder, Amer. Jour. Ophthalmol., January 1922, v, 16.*

**Eyegrounds in Tuberculosis.**—The writer has observed a special fulness and tortuosity of the retinal vessels in patients suffering from tuberculosis and those whose family history included cases of this disease. No heart lesions were present in these patients. Attention is called to these changes in the hope that they will be looked for by other ophthalmologists. Sometimes somewhat similar appearances have been found in the constipated.—*Certain Appearances Observed in the Eyeground of the Tuberculous, J. A. Patterson, Amer. Jour. Opthalmol., January, 1922, v, 30.*

**Destructive Ocular Tuberculosis in a Child.**—The case reported began as an iritis or iridocyclitis, later involving the sclera and cornea, taking on a confluent or conglomerate form, and resulting in rapid destruction of the eye in a comparatively short period of time, about seven weeks from the onset. Acute tuberculosis occurring in the eye of a child so young (four years) is extremely rare. It is said to occur more often between the age five and twenty-five, the average being 12 years.—*Destructive Tuberculosis in the Eye of a Child, H. R. Stillwell, Amer. Jour. Ophthalmol., January, 1922, v, 14.*

**Nasal Tuberculosis.**—Dr. William B. Chamberlin of Cleveland, Ohio, presented this paper, in which he stated that nasal tuberculosis was rare, but the primary form not as rare as ordinarily supposed. There was still some confusion in the use of the terms lupus and tuberculosis. Zerinko's classification into proliferative and ulcerative types was probably simplest and best. He thought the term lupus should be dropped, though Killian still clung to this term on account of the attenuated form of the infection and the chronicity of the involvement. The symptoms were usually those due to nasal obstruction with increased secretion. Pain was rare. Bleeding and crust formation were occasionally present. The places of predilection were usually the cartilaginous septum, inferior turbinate, nasal floor, and lateral nasal wall, in the order named. Bone involvement was secondary. Infection might be due to inhalation or to a direct lesion from an infected finger nail. The tubercle bacilli were always rare and might not be found at all. The presence of giant cells in fields of epithelial and lymph cells established the diagnosis, even though typical tubercles or tubercle bacilli were not found. Typical miliary tubercles with centres of cheesy degeneration were pathognomic. The essayist brought out the differential points between lupus, syphilis, malignancy, and foreign body with granulation. The treatment was surgical removal, with subsequent application of lactic acid or superheated air.

Dr. Emil Mayer of New York said he was one of those who still felt that they should retain the term lupus, because there was a great deal of difference between tuberculosis and the attenuated form of tuberculosis that we called lupus. Why not consider fingernail infection? These were cases in which the disease appeared in an area that could be reached easily by the fingernail on entering the nose. There was another form of lupus that could not be classed with either the ulcerative or the tuberculous. There were lymph exudative forms. He had seen cases of tuberculosis of the nose in which the only symptom was repeated attacks of laryngeal spasm. Examination showed yellow exudate which eventually showed miliary tuberculosis. The importance of making a diagnosis between lupus and tuberculosis was that in case the patient had lupus you could assure him that he did not need a change of climate, and in the second place it relieved him of the fear of conveying contagion. Why not treat these cases with the galvanocautery? That could be done safely in the nose and the condition eradicated as thoroughly as anywhere else, and with less danger of having an open wound.

Dr. Lee Wallace Dean of Iowa City, Iowa, stated that he had been making a study of chronic suppuration of the paranasal sinuses in patients suffering from pulmonary tuberculosis and also of chronic otorrhea in this class of patients. He found that many of the mastoids were tuberculous. To his surprise he found that tuberculosis of the paranasal sinuses was rare unless it was secondary to bone tuberculosis in the neighborhood of the diseased sinus. He had not found a single case of tuberculosis of the paranasal sinuses unless it was secondary to bone tuberculosis.

Dr. B. Alex Randall of Philadelphia mentioned a case of tuberculosis, which more or less completely involved the nasal chambers themselves. Many of the teeth were loosened. These were all removed and curettement of the alveolar processes carried out with removal of much of the nasal mucosa by Dr. Harrison Allen. The patient survived for twenty years or more.

Dr. Lee M. Hurd of New York reported several cases of mistaken diagnosis. One of these was a case of so called lupus—lupus of the lip and vestibule. Sections were found by one pathologist to be tuberculous. The case cleared up under mixed treatment. Other cases that were diagnosed as tuberculosis all cleared up under antisyphilitic treatment. They were all in the anterior part of the nose.

Dr. William B. Chamberlin of Cleveland, Ohio, said that personally he could not see any great justification for the term lupus. Dr. Mayer did not hear his remark about the fingernails being the most probable cause of infection. Airborne infection was the form most insisted upon, though the finger was the most probable cause of infecton. His suggestion in regard to treatment was *à propos*. He thought one should be careful in the use of the galvanocautery not to carry the cautery so deep that the cartilage became involved. In many cases he had made a probable diagnosis of tuberculosis, which was ultimately confirmed by the pathologist. In regard to Dr. Dean's reference to tuberculosis in sinus cases, he would say that he had not found it in such cases.—*Society Reports, American Laryngological Association, Med. Rec., October 29, 1921, c, 784.*

**Tuberculosis of the Tonsils.**—The mortality from tuberculosis markedly increased during the war, the unfavorable influences of this period causing a more acute course of the disease. The phthisis of old age increased in severity, as was also the case with childhood tuberculosis, a marked increased incidence being discernible. Hand in hand with the more malignant course of tuberculosis went an increased incidence of tuberculosis of the tonsils, it being present in almost all the cases of advanced pulmonary tuberculosis (36 of 38 cases), in about half (8 of 13 cases) of nonulcerative pulmonary tuberculosis, and in one-third (3 of 9) of the cases of tuberculosis not involving the lungs. In 48 cases without macroscopic findings there were 6 (12.5 per cent) with primary tonsillar tuberculosis. In 34 hypertrophied tonsils without clinical evidences of tuberculosis there was 1 case of histological tonsil tuberculosis. These results indicate a marked increase of tonsil tuberculosis for all the groups over other figures cited, while the figures for hypertrophied tonsils were not influenced by the war. It seems from this that hyperemia is the best protection against tuberculous infection. The increase in tonsil tuberculosis may be taken as a new proof of the diminished resisting power of the organism against the spreading of the tuberculous process without, however, drawing new conclusions regarding the tonsils as portals of entry for the tubercle bacilli.—*Über die neue Tuberkuloswelle; nebst einem Beitrag zum jetzigen Stand der Tonsillartuberkulose, H. Cramer, Beitr. z. Klin. d. Tuberk., January 10, 1921, xlvi, 309.*

**Arrested Laryngeal Tuberculosis.**—A woman of thirty-three first presented herself for examination April 2, 1918, with a history of four months' pregnancy, at the beginning of which she became hoarse; this had constantly become worse. She had no cough, pain, chill or sweats. The larynx showed infiltration of the right vocal cord, anteriorly and in the subglottic region. A diagnosis of suspected tuberculosis was made. When seven months pregnant the patient had decided dysphagia and aphonia. Examination showed dense infiltration of both arytenoids and ventricular bands, with probable ulceration of the posterior ends of the vocal cords. A report of advanced tuberculosis was made and immediate termination of pregnancy was advised. The advice was not taken. The patient was delivered at full term; the infant died of marasmus when only a few months old. Following the delivery the patient gained in weight and improved in general health. In December, 1918, she was again seen. Her color was good and she had gained in weight, but was almost aphonic. Infiltration of the arytenoids and ventricular bands was still present. Under continued applications of lactic acid, 25 per cent formalin, 2 per cent glycerite of tannin and argyrol, with forced feeding, open air regimen and vocal rest, the patient improved and the vocal lesions gradually disappeared.—*Arrested Laryngeal Tuberculosis, H S. Wieder, Laryngoscope, December, 1921, xxxi, 953.*

**Signs of Pulmonary Consolidation in Pericarditis with Effusion.**—In cases of pericarditis with effusion in children there are accompanying signs suggesting consolidation at the left scapular angle; these include dulness, bronchial breathing and bronchophony or egophony. A mistaken diagnosis of pneumonia may be made. The conclusions reached in this study are: 1.

The signs of apparent consolidation at the left scapular angle are, in all probability, due to the compression of the pulmonary tissue either by the heart or by the pericardium or by both. 2. The frequency of these signs and their location at the left scapular angle indicate that there is some causal relationship to the acute pericarditis. 3. These pulmonary signs seem to have little influence on the course of the disease, as the signs at the left scapular angle disappear with the improvement of the pericarditis.—*"Pericarditic Pseudopneumonia" in Children, M. S. Lewis, Med. Rec., February 25, 1922, ci, 327.*

**Bronchial Lymph Node Tuberculosis and Bronchial Asthma.**—Thirty children were given preliminary diagnostic tuberculin tests. Of these, 16 were absolutely negative and 14 were positive. The cases were then carefully studied by the X-ray. Quite irrespective of the tuberculin reaction, all of the cases showed radiographic chest changes; in particular, an increase in the size of the bronchial lymph node shadow. That these cases with negative tuberculin reactions were not in a passing phase of anergy was proved by repeating the tests over a considerable interval. Swelling of bronchial lymph nodes is in no sense peculiar to tuberculosis, for these nodes can become enlarged with any pulmonary disease; and such children are at an age when recurrent bronchitis is frequent. Moreover, after so short a period as eight or ten days the enlarged nodes may assume their normal size. In the normal lung the linear markings on the X-ray plate probably represent blood vessels rather than bronchi. In the asthmatic bronchus the lumen is reduced by swelling of the mucosa, as well as by the muscular contraction of the wall. Thus, instead of a hollow tube, an almost solid rod is present which casts a definite shadow on the plate. Asthmatic children in addition to the changes at the hilum show increased linear markings. Under treatment at sea-level, these children rapidly lost their increased linear markings.—*Asthma bronchiole und Bronchialdrüsen-tuberkulose der Kinder, E. Rüscher, Münch. med. Wchnschr., September 9, 1921, lxviii, 1155.*

**Tuberculosis of the Heart.**—In 1902 Anders summarized 71 cases of tuberculosis of the myocardium and added a case of his own. He classified the condition as occuring in 3 forms: large tubercles, miliary tubercles (less common) and a diffuse form of tuberculous infiltration (rare). He stated that cardiac tuberculosis was most frequent in early life, 40 per cent of his cases occurring under fifteen years. In a large proportion of cases the lungs and bronchial nodes were tuberculous. It is generally conceded that the mediastinal nodes act as the focus of infection for the pericardium and myocardium in this condition. Anders made note of the following symptoms: palpitation, feeble heart sounds, pericardial distress, diffuse pulsation, tumultous and rapid heart action, fetal and gallop rhythm, rarely murmurs, sudden and recurring syncope, dyspnea, cyanosis, unconsciousness, general edema and sudden death. There is apparently a relatively frequent occurrence of this unusual form of tuberculosis in the colored race. The brief clinical reports and necropsy findings of two colored young adult males are recorded by Weiss. Symptoms and physical signs were vague; necropsy demonstrated an immense fibrocaseous tuberculous involvement of the lymph nodes of the thorax, with extension to the pericardium, and in one case to the heart muscle, causing marked enlargement of the organ.—*Tuberculosis of the Heart, with the Report of 2 Cases, E. Weiss, Arch. Int. Med., January, 1922, xxix, 64.*

**The Heart in Pulmonary Tuberculosis.**—Healthy vigorous heart muscle and a normal blood pressure seem to act in a protective way against the development of pulmonary tuberculosis and, if tuberculosis should develop, to have a definite influence upon the process of repair and recovery. The converse of these observations seems also to be true. When valvular disease is associated with pulmonary tuberculosis, it will be found that in nearly every case the heart trouble has preceded the development of tuberculosis. It is extremely rare for valvular heart disease to develop after the onset of tuberculosis. In a considerable proportion of cases of pulmonary stenosis, pulmonary tuberculosis is the cause of death, apparently due to the poor circulation of blood through the lungs. In patients suffering from mitral stenosis pulmonary tuberculosis rarely develops and when it occurs the course of the disease is slower than usual; this is apparently because of the hyperemia of the lungs. In a considerable number of cases of pulmonary tuberculosis roentgenoscopy shows a narrow, vertically situated heart in which the beat is feeble and function is poor. This narrow appearance is not due to the rotation, for the right border is apparently normal in position. The left border appears shrunken. This type of heart is regarded as indicating a poor prognosis. In size it approaches the heart at the time of puberty and is held by some to be due to arrested development.

It may be due to the absorption of toxins from the tuberculous focus. In a case of doubt as to the diagnosis of tuberculosis the presence of this type of heart would be a deciding factor in recommendations with regard to treatment.—*The Heart in Chronic Pulmonary Tuberculosis, A. Latham, N. York M. J., February 15, 1922, cxv, 209.*

**Primary Tuberculosis of Stomach.**—After a review of the different varieties of gastric tuberculosis and of 6 cases of primary gastric tuberculosis described to date in the literature, a case is reported in detail. The disease started five months before operation with epigastric oppression, loss of appetite and constipation, followed by frequent vomiting, and epigastric pain independent of food ingestion. There was marked loss of weight, but no heartburn or belching. No tuberculous focus could be detected in the lungs. Gastric analysis was positive for hydrochloric acid and revealed a total acidity of 20. Fluoroscopy and X-ray disclosed an hour-glass stomach with intense narrowing of the lesser curvature in the lower third. The operation revealed extensive adhesions of the stomach to the liver, the omentum and the pancreas. Resection of the pylorus and a piece 12 cm. long of the stomach at the greater curvature was done. The patient recovered completely. The tuberculous nature of the ulcer was discovered during microscopic examination. Subsequent to the operation three tuberculin injections were followed by no reaction.—*Zur Kasuistik der Magentuberkulose, Biernath, Deutsch. med. Wchnschr., September 15, 1921, xlvii, 1091.*

**Tuberculous Appendicitis.**—The patient, age thirty-one, discovered that she was suffering from pulmonary tuberculosis thirteen years previously. Six years before she had had an ischiorectal abscess which was incised. Bacilli were found in her sputum eight months previously. Ten years before admission to the hospital she had her first attack of pain in the abdomen which was diagnosed appendicitis at that time. Since then she had similar attacks with increasing frequency. The last attack began four days prior to her entrance, with pain localizing in the right iliac fossa and without vomiting. Her temperature was normal. On physical examination there was local tenderness over McBurney's point and a small palpable mass. The lungs showed definite tuberculosis of both apices. Appendicectomy was performed under gas-oxygen anesthesia. The appendix was very much swollen and reddened, not adherent. There were no tubercles or other signs of tuberculosis anywhere in the abdomen. The appendix was removed, and on section showed no pus, but a peculiar thickening of the submucous tissue. The patient made an uneventful recovery. On microscopic examination the appendix was found to contain tubercles in the mucosa, submucosa and muscularis. There was marked polynuclear infiltration and beginning abscess formation between the submucosa and muscularis. Microscopic diagnosis of tuberculosis of the appendix with acute exacerbation was made. Tuberculosis of the appendix occurs in from 0.16 to 3 per cent of all appendices examined. True primary tuberculous appendicitis without peritonitis or other abdominal involvement is exceedingly rare.—*Tuberculous Appendicitis, Report of a Case, A. H. Noehren and T. Mueller, Surg. Gyn. & Obst., February, 1922, xxxiv, 215.*

**Nodular Tuberculosis with Cirrhosis of Liver.**—A case of markedly enlarged liver, occasioned by grotesque connective tissue growth and associated with large nodular tubercles, is described. The condition is rare, there being only 34 cases in the literature up to 1921. The case was that of a man who developed a cardiac and liver insufficiency about six months before death. It is noteworthy that nodular liver tuberculosis is rare in spite of the fact that in the majority of consumptives, especially with coincident intestinal disease, large numbers of bacilli pass the organ by way of the blood, while in the nodular form no other larger or no other focus is discernible. These facts are explicable only if it is considered that in this case the infection occurs through the lymphatic route and not by the blood. This conception is supported by animal experiments and by findings in negroes dying of phthisis. In these the spread of infection occurs mainly by the lymphatic channels, and there occurs mainly nodular liver and splenic tuberculosis. The cirrhotic changes in the liver are not considered tuberculous cirrhosis. Three possibilities of the origin of the condition are given: 1. A nodular tuberculosis developed in the cirrhotic liver. 2. The tubercle bacillus added its cirrhotic action coincidently to that of alcohol (the patient being an alcoholic). 3. The tuberculosis alone occasioned the formation of the connective tissue masses. The last is considered the least probable possibility, and of the first two the author inclines to the second idea, although he admits conclusive evidence is lacking.—*Über grossknotige Lebertuberkulose kombiniert mit Leberzirrhose unter dem Bilde einer Lebervergrösserung, W. Culp, Beitr. z. Klin. d. Tuberk., January 10, 1921, xlvi, 219.*

**Healed Case of Tuberculous Peritonitis.**—Laparotomy was followed by reaccumulation of fluid which was withdrawn monthly by paracentesis with a final cessation of its formation.—*Geheilter Fall von Peritonealtuberkulose, Jentsch, Centralbl, f. inn. Med., January 22, 1921, xlii, 50.*

**Insufflation of Air in Exudative Tuberculous Peritonitis.**—Six cases of tuberculous peritonitis with effusion were treated by tapping and insufflation of air. Resorption of the exudate occurred in five of the six; in two cases it required only one treatment; in one case, two treatments; in one, three treatments; in one, four treatments. The quantity of the effusion progressively decreased. At the same time the general condition improved, weight was gained, pain diminished, digestion improved, menstruation was reëstablished and three of the six cases completely recovered without sequellae. In the other three the general condition showed no improvement because of tuberculous complications in other organs. Tuberculous peritonitis is less likely than tuberculous pleurisy to be a localized process and a complete examination should be made before employing this treatment. The method should be considered of prime importance as a treatment of tuberculous peritonitis with ascites.—*La pneumoséreuse thérapeutique dans les épanchements des péritonites tuberculeuses, P. Emile-Weil and Loiseleur, Meeling, Société Médicale des Hôpitaux, December 16, 1921, reported in Le Prog. Méd., December 24, 1921, no. 52, 608.*

**Oxygen Inflations of Peritoneal Cavity in Tuberculous Peritonitis.**—Three months after a uterine suspension was done and adhesions separated, the patient developed an acute exudative tuberculous peritonitis with marked accumulation of fluid. Oxygen inflations were given into the peritoneal cavity and after two months improvement was marked. During a later recurrence of symptoms an abdominal incision was made and the original diagnosis was confirmed by histological examination. In these cases oxygen inflation offers a tremendous advantage over laparatomy as a therapeutic measure. Inflations may be done as often as indicated, ten to fifteen or more times. The patients experience little or no discomfort. It is advisable to remove the ascitic fluid. Ascitic patients can tolerate as much as five or six litres of oxygen owing to the distention of the abdomen by the fluid.—*Oxygen Inflations of Peritoneal Cavity in Tuberculous Exudative Peritonitis, A Stein, J. Am. M. Ass., March 11, 1922, lxxviii, 718.*

**Influence of Intestinal Stasis on Pulmonary Tuberculosis.**—The presence in the urine of such amino acid derivatives as indican, skatoxyl, indol and tyromine is an indication of intestinal stasis and the invasion of the lower ileum by bacteria normally confined to the colon. To determine the influence of stasis a special study of 32 cases of pulmonary tuberculosis was made. The first two facts established were that skatoxyl is frequently found in the urine of such cases and that these sulpho-ethers are often diminished by the administration of castor oil or calomel or, in some cases, of kaolin. In most cases showing an excess of sulpho-ethers the temperature is of a type due to secondary infection. In extensive, chronic disease with recent activity, the sulpho-ethers were small in amount. In patients complaining of nausea, possibly accompanied by yawning and sighing respiration, the symptoms may be due to acetone. In so called "bilious attacks" there is possibly no acetone while the increase in sulpho-ethers depends on whether gastric or intestinal symptoms predominate. In "short fevers" the urine shows a considerable increase in amino acid derivatives. In cases where there is a progressive rise in temperature, malaise and fatigue the symptoms are usually due to intestinal stasis; if there is no change in the character of the urine after purgation, an exacerbation of the tuberculous focus should be suspected. In treating patients with artificial pneumothorax, a dose of castor oil preceding the operation will often prevent reactions referable to stasis. Patients without stasis usually have no reactions and when they do occur they are of short duration. The intestinal bacteria responsible for the appearance of sulpho-ethers in the urine are of the colon group; when a streptococcus is the dominant organism, sulpho-ethers are not a feature. A long established chronic intestinal stasis may not respond to any treatment. Kaolin, paraffin, agar, dimol and salol are the most satisfactory drugs for continued administration. A reduced protein diet may be beneficial. Intestinal organisms are probably in close relation with those causing secondary infections in the lungs and an excitation of one may arouse the other to activity.—*Pulmonary Tuberculosis and Intestinal Stasis, H. N. Davies, Tubercle, February, 1922, iii, 193.*

**Intestinal Obstruction Following Operation for Tuberculous Enteritis.**—In a patient from whom a section of intestine had been removed to relieve an ileocaecal tuberculosis, symptoms of intestinal obstruction developed. Supposing the anastomosis to be functionating badly a second

operation was performed and three tuberculous foci were discovered in the small intestine. Two of these, separated from each other by 40 or 50 cm. of healthy intestine, caused stenoses of the intestinal lumen; they were resected and an end to end anastomosis was done with temporary relief of symptoms. A year later the patient died with a generalized tuberculous peritonitis.—*Tuberculose de l'intestin grêle, Robineau, Meeting, Société de Chirurgie, November 30, 1921, reported in Le Prog. Méd., December 10, 1921, no. 50, 586.*

**Relation of Fistula in Ano to Tuberculosis.**—Fistula in ano may be associated with pulmonary tuberculosis, but this occurs less frequently than generally believed. Of 5000 fistulae examined and treated, less than 10 per cent were tuberculous. The percentage of patients with lung tuberculosis having also fistula in ano varies, according to statistics, from 1 to 30, but the actual number probably does not exceed 5 per cent. Tuberculous fistulae that heal are occasionally encountered in persons having no other tuberculous foci. Tuberculous anorectal ulcers and fistulae may be caused by either the human or bovine bacillus, but the former is responsible for 98 per cent of the cases. In 95 per cent of the cases the sinus is secondary to tuberculosis in other organs, usually the lung, and in 5 per cent the disease is primary. The pulmonary lesion usually precedes the fistula, but occasionally infection elsewhere is secondary to anorectal tuberculous ulceration and fistula. Tubercle bacilli apparently enter the blood or lymph vessels during or following operations on such fistulae, for joint tuberculosis has developed shortly following the laying open of sinuses. Tuberculous fistulous openings usually have irregular, serrated, rounded, highly colored borders, rarely sensitive to touch. They are seldom painful, because of the large size of their internal and external openings from which pus freely escapes, forestalling distention and throbbing pain. The discharge is abundant and thin, and of a whitish hue and offensive odor. Tubercle bacilli may be demonstrated in the discharge, scrapings from the tract or sections from the fistula wall. The treatment is palliative and hygienic, and the vitality of the patient determines whether or not an operation is indicated. Anorectal tuberculous sinuses and the majority of ordinary fistulae in tuberculous subjects are readily operated upon under local anesthesia. Rarely, deep and complicated fistulae requiring general narcosis are divided under gas, gas-oxygen or chloroform anesthesia, but never under ether. One-eighth per cent eucaine solution is used as a local anesthetic, and after the sinus has been divided and its overhanging edges removed it is treated with phenol or cauterized, to prevent extension by way of the injured lymph or blood vessels and packed with gauze to control bleeding. Some surgeons excise tuberculous fistulae but the division operation is preferable.—*Relation of Pulmonary and Anorectal Tuberculosis to Fistula in Ano, S. G. Gant, Am. J. Surg., December, 1921, xxxv, 368.*

**Tuberculoma of the Ischiorectal Fossa.**—The patient had a hard, symmetrically round, cartilaginous mass in the ischiorectal fossa. It did not feel or appear inflammatory, and was very dense and the size of a hen's egg. The tentative diagnosis was a growing tumor, probably lipoma with a tough capsule. The mass was excised and proved to be an encapsulated tuberculoma containing thin pus. The patient recovered satisfactorily.—*Tuberculoma of the Ischiorectal Fossa. A Case Report, C. C. Mechling, Am. J. Surg., December, 1921, xxxv, 371.*

**Tuberculosis of the Adrenals.**—This report covers a case of Addison's disease, presenting the characteristic clinical symptoms of progressive weakness associated with bronzing of the skin in a man of forty-three years. Pathologically, the case presented a typical, localized and focalized tuberculosis of both adrenals, with an arrested apical pulmonary tuberculosis of a probable unassociated nature. The direct smear from the adrenal showed the presence of tubercle bacilli in large numbers. Animal inoculation with crushed material from the adrenal produced experimental tuberculosis from which tubercle bacilli were obtained in culture.—*Addison's Disease: A Case of Tuberculosis of the Adrenals, R. A. Keilty, Amer. Jour. Med. Sci., February, 1922, clxiii, 282.*

**Tuberculosis of the Kidney in the Aged.**—This localization of tuberculosis is rare in those beyond the age of sixty or perhaps it would be more nearly correct to state that few are operated on in advanced life. Marion has operated on 273 patients, counting only his nephrectomies, and among this number 18 were more than fifty years of age. Figures limited to medical cases show a somewhat larger percentage of the elderly, as might be anticipated. In a recent Paris thesis (Lepidus, 1920) there are case histories of patients aged 61, 64 and 72 years. Apparently the physiological sclerosis of the kidneys of individuals over seventy tends to make the kidneys more immune.

Some of the findings of Lepidus are given by Plicque in the *Journal de médecine et de chirurgie pratiques* for October 25, 1921, xxcviii, 20. The symptoms at the onset are purely vesical and by reason of the age factor cystitis is apt to be the diagnosis. One thinks of everything but tuberculous nephritis—of prostatic hypertrophy with secondary cystitis, of renal or vesical calculus and of cancer of the prostate, bladder or kidney. Errors of diagnosis are commonly made. But the disease progresses rapidly, albeit perhaps slowly in comparison with early life. Sooner or later the picture of a nephritis looms up and it may take the form of a medical or surgical nephritis. It is of course not to be suggested that a competent urologist who examines all his cases systematically will be deceived in making his diagnosis, but the author is evidently writing for the benefit of the general practitioner. The hazard of nephrectomy with the other kidney intact is not much increased in the elderly, for Marion lost but one of his 18 patients from the intervention. The cystitis may subside spontaneously after nephrectomy, or it may persist and be aggravated, requiring extreme measures to control it—cystotomy, iodine vapor, fulguration, etc.—*Tuberculosis of the Kidney in the Aged, Editorial Note, Med. Rec., December 17, 1921, c, 1079.*

**Female Genital Tuberculosis**—The occasional difficulty in differentiating tuberculosis from carcinoma of the cervix is discussed.—*Ein Beitrag zur Diagnose der weiblichen Genitaltuberkulose, M. Rudeloff, Centralbl. f. Gynaek., June 18, 1921, xlv, 854.*

**So Called Surgical, Non-Visceral Tuberculosis.**—This is an extended discussion of the etiology, prophylaxis, and therapy of surgical tuberculosis.—*Erfahrungen und Kritik in Dingen der sog. Chirurgischen nicht viszeralen Tuberkulose, Wieting, Arch. f. klin. Chir., May 24, 1921, cxv, 868.*

**Bone and Joint Tuberculosis.**—This is a discussion at the German Orthopedic Congress by many of its members on the therapy of bone and joint tuberculosis.—*Kongress der Deutschen Orthopädischen Gesellschaft, Berlin, 18–20 Mai, 1921, Secretary, W. V. Simon. Ztschr. f. Tuberk., October, 1921, xxxv, 112.*

**Treatment of Tuberculosis of Bones and Joints in Children.**—Gauvain comes to the conclusion that in urban hospitals there may be some justification for radical treatment, but in the specially designed and equipped country hospitals facilities for utilizing various methods of treatment, such as heliotherapy and balneotherapy, are available; and the modern tendency is to permit less and less primary radical surgical interference. To-day, radical measures are rarely called for in the treatment of tuberculous bone and joint disease in children; and, as the indication for their employment has diminished so the results, both as regards ultimate mortality and orthopedic function, have improved. The lowered mortality is striking and worthy of record, but not less remarkable is the improvement in orthopedic results. In over 2000 cases treated to a conclusion at Alton the mortality during treatment was less than 2.5 per cent.—*Discussion on the General Principles of Treatment in Tuberculous Disease of the Bones and Joints in Children, H. Gauvain, Brit. M.J., November 26, 1921, no. 3178, 876.*

**Tuberculosis of the Spinal Cord.**—This report brings the total number of cases of tuberculosis of the spinal cord mentioned in the literature to eighty. The diagnosis is determined by signs of progressively developing tumor of the spinal cord which must be differentiated from nontuberculous tumors. The prognosis is grave and the treatment is surgical. Starr and Elsberg report cases in which tuberculomata were removed surgically. In the case reported here, the patient had pulmonary tuberculosis and later developed paralysis of the left leg. The left knee jerk was exaggerated and Babinski's sign was positive on both sides. Sensation was normal. Two days later the right leg became paralyzed and there was urinary retention. The spinal fluid pressure was increased but no tubercle bacilli were found in it, and the Noguchi and Wassermann tests were negative. The paralysis was progressive in the legs except that there was a slight return of motion two weeks after the first examination. The patient died at the end of a month. At autopsy tubercles were found in the suprarenal glands, the right kidney and on the mitral valve. A grayish nodule about the size of a navy bean was located in the spinal cord at the level of the eighth thoracic vertebra; this lay beneath the meninges anteriorly, extending further to the right than to the left. For some distance above and below the tumor, the cord was in a semifluid condition. Microscopical examination of the nodule revealed granulation tissue containing acid-fast bacilli.—*Report of a Case of Tuberculosis of the Spinal Cord, C. C. Browning, Med. Rec., December 10, 1921, c, 1021.*

**Tuberculosis of the Spinal Cord.**—A woman, aged 25, had pains in the back and headache, but no vomiting. Later, there was stiffness of the neck and paralysis of the legs. Abdominal reflexes below the umbilicus disappeared, and there was hyperesthesia of the legs. There were no cranial nerve symptoms. Retention of urine developed. The spinal fluid showed 1100 cells per cmm., mostly lymphocytes; cultures were sterile and no tubercle bacilli were found. Fever continued, paralysis became complete in the legs, irregular contractions of the right arm and right side of the face appeared and the patient died in coma about a month after the onset. The clinical picture suggested poliomyelitis, but the meningitic phenomena pointed to tuberculosis. At necropsy tuberculosis was found in other organs and there was a diffuse meningomyelitis of the whole spinal cord. The process spread from the membranes along the vessels into the cord, a perivascular extension similar to that described in acute poliomyelitis and, in the case of the brain, in lethargic encepahlitis. Tuberculous spinal meningitis rarely takes this course. The changes in the membranes and the nerve roots and the marked edema must have caused great functional disturbances. There were many tubercles in the membranes and the meningitis involved the base of the brain as well as the cord. In a second case, a man, aged 23, complained of weakness and lassitude and had paralysis of the legs, which increased steadily, as disturbance in sensation appeared with fever. He had pulmonary tuberculosis also. Death occured after two months in the hospital. At autopsy miliary tubercles were found in most of the organs and there were scattered tubercles in the cranial meninges and solitary tubercles in the cerebellum, pons and hemisphere. In the fifth and sixth thoracic segments there was a solitary tubercle, 2 cm. long and 1 cm. in diameter, surrounded by soft hemorrhagic cord substance. The tubercle was caseous and interrupted almost completely the continuity of the cord. There was typical ascending and descending degeneration and a moderate meningitis. To Doerr's report of 74 such cases in 1911 only a few more have been added. Most cases occur in children with tuberculosis in other organs. Extension to the cord is hematogenous and localization may be in any part of it. The tubercles grow slowly and symptoms are those of tumor of the cord. Surgical removal of the tubercle resulted in recovery in one case.—*Tuberculosis of the Spinal Cord with Peculiar Changes, F. Harbitz, J. Am. M. Ass., February 4, 1922, lxxviii, 330.*

**Shoulder Sign of Tuberculous Meningitis.**—The value of "Binda's sign" for the early diagnosis of tuberculous meningitis is confirmed. The sign is the sudden movement of the shoulder when the head is passively turned to the opposite side. The hand is placed on the patient's head, which is turned slowly and gradually from side to side to relax the muscles of the neck. Then the head is suddenly and abruptly twisted so as to bring the chin as near as possible to the other shoulder. As this is done the first shoulder makes a sudden upward and forward movement and persists in this position, resisting attempts to replace it until the head is released. Tronconi found the sign constantly positive in seven cases of tuberculous meningitis. A positive response was always obtainable before the other well-known signs could be elicited,—with the exception of the Brudzinski sign, with which it appeared contemporaneously. Though not considered pathognomonic of the tuberculous form of meningitis, the sign was much more regularly present in this than in other forms of meningeal irritation.—*Del fenomeno della spalla nella meningite tubercolare, S. Tronconi, Pediatria, September 1, 1921, xxix, 802.*

**Tuberculous Meningitis with Dry Spinal Subarachnoid Space.**—During the four weeks before admission to the hospital, a male infant, aged five months, suffered from projectile vomiting, gradually increasing fretfulness, and varying temperature, at times reaching 104°F. He was breast fed and had had no previous illness. The family history was negative for tuberculosis. Two convulsions, five and two days before admission, followed by a semistuporous condition, led to admission to the hospital one week before death. On admission moderate opisthotonos, right-sided Kernig, complete blindness, unequal pupils, bulging fontanel, rigidity of the right arm, general hyperesthesia, Cheyne-Stokes respiration and rigid abdomen were all present. Repeated spinal punctures produced no fluid, with the exception of the first two punctures after admission, fluid from which was under normal pressure and showed a slight increase in cells (lymphocytes) and a strongly positive test for globulin. Autopsy revealed that there was practically no subarachnoid space at most levels, the dura and pia being adherent. The pia was markedly thickened and studded with tubercles. Generalized tuberculosis was found in addition. No similar case reports were found in the literature.—*A Case of Tuberculous Meningitis with a Dry Spinal Subarachnoid Space Due to*

*Diffuse Tubercle Infiltration of the Spinal Meninges, J. C. Regan and G. W. H. Cheney, Am. J. Dis. Child., November, 1921, xxii, 516.*

**Cutaneous Tuberculosis Following Measles.**—Following measles various forms of cutaneous tuberculosis may develop, such as gumma, lupus, or lichen scrofulosorum, either combined or separately, the latter of which is more common. Lupus is the most frequent of all and deserves mention because of the special characters it presents. Although not absolute, they impart a special aspect to this cutaneous lesion following rubeola. In lupus vulgaris, the process ordinarily beings by a small nodule which slowly enlarges and after a number of years attains a large size. Postrubeolic lupus, on the contrary, has a sudden onset and usually several spots develop at the same time on different parts of the body like a true exanthem, occasionally resembling varicella. Successive eruptions are not common, the elements rapidly reaching their final dimensions. The process, therefore, is striking by reason of its wide dissemination. Patches are met with on all parts of the body and limbs, but rarely on the face; these lesions frequently assume the verrucous type. The elements composing the patches are usually small, varying from the size of a millet seed to that of a hemp seed, rarely reaching a centimetre in diameter; the smallest are formed by a single nodule, the larger by five or six agminate nodules. The patches are numerous, frequently as many as fifty, or less often there may be only five or six or less. These forms of lupus have a relatively benign evolution; the patches very rarely ulcerate and usually do not give rise to the great destruction of tissue met with in the ordinary forms of the disease. When once developed the eruptive elements often remain stationary and occasionally disappear spontaneously, sometimes leaving cicatrices or sometimes without trace. A slight pigmentation may be the only evidence of their former presence. Mild local treatment, such as the application of guaiacol, may result in a cure, and although the lesions do not usually yield to such simple therapeutic measures, they are, on the whole, easily cured by total excision, cauterization or scraping, and do not relapse. A benign evolution of the process is the rule, but in some few instances the lesions undergo an evolution similar to that of lupus vulgaris. Generally speaking, it would appear that when the lesions are few in number they rarely have a tendency to spontaneous retrogression, but they nevertheless differ from ordinary lupus in that they can be easily cured by appropriate treatment. This benignity of postrubeolic lupic lesions might, at first sight, lead one to doubt the tuberculous nature of the process, but in every case in which histological examinations and inoculations have been carried out, the diagnosis has been unquestionably confirmed. For that matter, the tubercle bacillus is more easily demonstrated in these lesions than in ordinary lupus, the lesions sometimes being alive with bacilli. This occurs particularly in the very acute processes, manifested by an external generalized granulia. Tuberculosis of the lymph nodes is less rare and in a number of cases it coincides with or precedes the cutaneous lesions. Joint tuberculosis is also met with after rubeola, but usually the lungs escape infection. In one or two recorded cases tuberculous meningitis caused death. Briefly stated, ordinary lupus and postrubeolic lupus resemble each other only in the elementary lupic nodule and their histological characters, but differ profoundly in the number and distribution of the lesions and the evolution of the cutaneous changes. Ordinary lupus forms a single patch; postrubeolic lupus occurs in multiple patches: the former has a tendency to ulcerate and destroy the tissues; the latter to become fixed or with a tendency to retrogress. Ordinary lupus resists treatment; the postrubeolic form is hastened to recovery by treatment and, although the latter may not merit being regarded as a special morbid entity, it is, from its very peculiar clinical aspect, a lesion quite distinct from lupus vulgaris. Among the other postrubeolic cutaneous tuberculoses it is to be remarked that verrucous tuberculosis from the viewpoint of development and distribution of the lesions offers the same characters as ordinary lupus, but histologically it presents the structure of an anatomical tubercle. Tuberculous cutaneous gummata rarely present such a vast dissemination or so rapid a development, only a few elements of lichen scrofulosorum being met with among the gummata. But as a rule the different forms of cutaneous tuberculosis rarely occur singly and may be simultaneously met with in the same subject with a more or less marked predominance of one or the other. Nevertheless, whatever may be the variations in their grouping, they preserve the remarkable characteristics already referred to and consequently should occupy a special place in cutaneous pathology.—*Editorial, Med. Rec., November 19, 1921, c, 898.*

**Relation of Erythema Nodosum to Tuberculosis.**—This affection resembles a constitutional infectious disease of the exanthematous type, being preceded by the typical prodromal stage of these affections, having an epidemic and even at times contagious incidence, and relapsing occasionally. It must not be confounded with erythema induratum which is a tuberculous manifestation. Nevertheless, patients with the nodose form, while but seldom tuberculous, often come of tuberculous stock. Roentgenography of these subjects shows as a rule no tracheobronchial adenopathy. It is true that old clinicians regarded nodose erythema as allied in some way to tuberculosis, and it is of course possible that there is a special form of this origin. Some of the subjects give a positive cutireaction, but this is no proof that the eruption is motivated by the bacillus. Recently, a few writers have come out positively in favor of the view that the dermatosis tends to appear predominately in a tuberculous soil. But we find no evidence of an association of the latter with clinical tuberculosis. In an endeavor to throw light on the etiology of erythema nodosum Demiéville of Lausanne had an assistant investigate 300 cases which had been treated in the Polyclinic during a period of twenty-two years (*Revue médicale de la Suisse romande*, October 10, 1921, xi, 10.) A survey of the tabulation which gives the antecedents and coexistent phenomena with, in some instances, the family history seems to show plainly that the dermatosis, so far as Geneva is concerned, is an autonomous disease in which there is no more tuberculosis, rheumatism, etc., than there would be in an equal number of controls. All of the ordinary dispensary affections are properly represented, as anemia, adenoids, hysteria and neurasthenia, gastric disturbances, syphilis, cough and bronchitis, chlorosis, etc., but none was present to any striking extent.—*Erythema Nodosum, Editorial Note, Med. Rec., December 17, 1921, c, 1079.*

**Subsequent Note on Erythema Nodosum.**—In the *Medical Record* for December 17, 1921, was an editorial note in which it was stated that this affection is regarded by Damiéville of Lausanne as *sui generis* and not secondary to tuberculosis or any other general infection. The material on which this opinion was based was of the polyclinic type. But in the *Bulletin Médical* for December 3, 1921, xxxv, 49, Saquépée relates a case of pneumococcus septicema in the course of which the patient developed both herpes zoster and erythema nodosum, the latter typical in appearance. He recalls that in 1905 Loiseleur saw erythema nodosum complicate a streptococcus sepsis. There were no prodromes, for, of course, such could not have been recognized in the presence of septicemia. Tuberculosis could be excluded. The septicemia was not of a high degree and there was no lesion of the lung, which is very unusual in this form of sepsis. The reader obtains the impression that these dermatoses were due directly to the parasitism of the pneumococcus. The latter, which was recovered from the blood in pure culture, was of the variety known as pneumococcus, type 1. The case in question recalls an old view that this dermatosis was the result of a low form of rheumatoidal sepsis and could be accompanied by endocarditis. This rheumatic theory seems to be supplanted by the view that the underlying process is tuberculous. At the present time, therefore, we seem to know less than ever about the malady which has recently been pronounced an infection *sui generis* as above stated.—*Bacteriemic Erythema Nodosum, Editorial Note, Med. Rec., January 14, 1922, ci, 66.*

**Skin Tuberculides Produced by Tuberculin.**—The author reports experimentally produced skin tuberculides, resulting after a number of injections of pure tuberculin (Partigen *L*) into his own skin, and concludes that skin tuberculides can arise from the administration of solutions of the toxic parts of the tubercle bacillus free from all formed elements.—*Tuberculide der Haut hervorgerufen durch Reintuberkulin, V. Čepulič, Beitr. z. Klin. d. Tuberk., February 10, 1921, xlvi, 469.*

**Acute Miliary Tuberculosis.**—In France the term *granulie* is used to express miliary tuberculosis, as distinct from pulmonary consumption. The English equivalent would be granulia or granulosis. *Granulie* may occur as an acute event in the course of ordinary chronic tuberculosis. In *La Progrès Médical* for October 29, 1921, xlix, 44, Ramond reports the case of a girl who made a good recovery from pleuropulmonary tuberculosis and then became acutely ill with a high temperature and respiration of 60 a minute. The diagnosis of a hopeless miliary tuberculosis expressed clinically as a suffocative catarrh was made. Ordinarily, with such symptoms, it would be necessary to exclude cardiac disease, pulmonary edema from Bright's disease, bronchopneumonia and perhaps other maladies. If symptoms were less acute and less pronounced typhoid fever might require exclusion. Caseous pneumonia and so called galloping consumption are different from *granulie*.—*"Granulie," Editorial Note, Med. Rec., December 31, 1921, c, 1162.*

**Differentiation of Nontuberculous from Tuberculous Pulmonary Disease.**—Military and civil experience has shown that the confusion of nontuberculous pulmonary disease with tuberculosis is not uncommon. Among the nontuberculous conditions to be eliminated are affections of the upper respiratory tract, such as nasal obstruction causing chronic cough and symptoms of bronchitis or tracheobronchitis, diseases of the nasal sinuses or tonsils, or a chronic nasopharyngitis with such symptoms as chronic cough, mucopurulent expectoration and blood-streaked sputum. In some cases these will be accompanied by impaired apical resonance and modified breathing, probably due to deficient expansion of the lung. Differentiation is based on the lack of constitutional disturbances, in spite of persistent local symptoms, absence of definite signs of apical disease and absence of tubercle bacilli from the sputum. Influenzal infections are usually of short duration but, if suspicious symptoms or signs, including râles, persist after the attack, the patient should be kept under close observation and frequent sputum examinations should be made. In acute bronchitis the râles are usually bilateral and basal, while the râles of tuberculosis are usually apical and not so evenly distributed. Unilateral bronchitis is uncommon. In chronic bronchitis the symptoms may have been of long duration but there is little deterioration of general health; here again râles are usually basal and the sputum is negative for tubercle bacilli. There are, however, definite instances where tuberculosis simulates chronic bronchitis, and sputum examination, therefore, should never be neglected. There are certain low grade lower lobe bronchopneumonias that may simulate tuberculosis, but the X-ray plate shows little or no change, the duration is short in view of the extent of the physical signs and the sputum is negative. Bronchiestasis may be of long duration and is differentiated by such factors as clubbing of of the fingers, fetid sputum, paroxysmal cough often precipitated by a change in posture, absence of tubercle bacilli, frequent appearance of good general health and physical signs most often confined to the lower lobe. The X-ray may show the bronchiectatic cavity. A large percentage of pleurisies are tuberculous but, in view of the permanent recovery of some of these cases, it hardly seems fair to make a diagnosis of tuberculosis upon the general principle that all pleurisies are of a tuberculous origin. Pneumokoniosis may simulate tuberculosis and, where this is a possible factor, repeated sputum examinations should be made before tuberculosis is unreservedly diagnosed. There is no evidence that gas inhalation, as suffered by soldiers in the late war, conduces to the development of tuberculosis. Many cases of suspected lung disease must be observed for a long time and it is unjust and often cruel to the patient to make a definite diagnosis of tuberculosis without good and sufficient evidence.—*Common Pulmonary Diseases Confused with Tuberculosis, E. O. Otis, Boston M. & S. J., January 12, 1922, clxxxvi, 41.*

**Value of Sanatorium Treatment of Tuberculosis.**—The achievements of the last twenty-five years have changed the attitude toward the tuberculosis problem from one of despair to that of hope and anticipation and have stimulated younger medical men to work in this field. Hermann Brehmer, who founded his institution in Goerbersdorf in the mountains of Silesia in the latter fifties of the last century, may be considered the father of sanatorium treatment. Dettweiler, his pupil, continued the work at Falkenstein in Germany, and Trudeau was the first to demonstrate what could be accomplished in America. Acting on certain suggestions of the elder Bowditch, a small building was erected at Sharon, Mass., where it was hoped to show that patients could be benefited by proper management, near or in their homes. The building was opened in February, 1891, and within five years there was sufficient proof that the results were comparable to those obtained at places possessing conditions of climate, etc. Alfred Worcester acknowledged the truth of the claims and, through his influence, the immediate result was the establishment in October, 1898, of a state institution for the treatment of hopeful early cases of tuberculosis at Rutland, Mass. This was the first state sanatorium in the United States. In the beginning certain zealots reflected unfavorably on the sanatorium idea by claiming rapid cures, naturally to be followed by many relapses, but no claim was ever made by those who best understood the disease that by the establishment of sanatoria the panacea had been found for exterminating the disease. Personal experience is convincing of the value of such treatment, not only in restoring health but also in furthering the cause of preventive medicine. Among 160 patients discharged from the Sharon Sanatorium from 1891 to 1906 with disease arrested, the following results were reported in 1908: Living and well, 83+ per cent; not recently heard from but doing well at last report, 3.7 per cent; relapsed and died, 13+ per cent. Only proved cases are included in this report. In the past two years a children's pavilion

or preventorium has been established at Sharon. The results of treatment of young children have been wonderfully beneficial. Among the poor there is an evident willingness to send children to these institutions, but people of moderate means hesitate to put their children in an environment of what they consider uncertain influence. A knowledge of the atmosphere of health, cheer and refinement pervading the Sharon Preventorium should dispel this fear and physicians especially should convince themselves of the great benefits to be derived under the mild dicipline and hygienic conditions of sanatorium life. Increased effort must be made to provide for the aftercare of the tuberculous patients and such projects as the establishment of farm colonies afford much promise in this direction. The Farm Colony and Vocational Workshop for ex-service men and civilians is meeting with marked success at Rutland, Mass. Sanatorium treatment is not a panacea but it is one of the vital factors in the whole field of our efforts to eradicate tuberculosis; an adjunct to every other possible means that we can furnish for its cure and prevention.—*What May Be Expected from Sanatorium Treatment? V. Y. Bowditch, Boston M. & S. J., clxxxv, 776.*

**Home Treatment of Bone and Joint Tuberculosis.**—Speaking generally, and with one or two exceptions, in osteoarticular lesions, the early case should be kept at home, the more advanced sent away. This article is based on the reports of 30 patients with bone or joint disease treated in the past two years. Six of these had to be sent away for institutional care. Sixteen home patients did practically as well as Rivers has seen cases do at surgical tuberculosis hospitals. The plan of home treatment was to have the child's bed put next to an open window; and appropriate extension was applied. When quiescence of the lesion is obtained with good position, a splint can be applied and the patient allowed up, on crutches in leg cases. Finally, a plaster cast of the part is taken and a celluloid splint made. Quiescence of the lesion was secured in 14 of the 24 patients. In 4 cases the lesion was quiescent when the patient was first seen. In 6 cases the disease remained active.—*Domiciliary Treatment of Bone and Joint Tubercle, W. C. Rivers, Lancet, December 3, 1921, cci, 1155.*

**Switzerland as a Health Resort.**—The sun's heat in Switzerland during autumn and winter appears considerable to a native of the British Isles. Changes of weather in Switzerland are much more definitely marked as contrasted with England. Recreations, living accomodations and the cost of living are discussed.—*Switzerland as a Permanent Residence for the Tuberculous, B. Stracey, Brit. J. Tuberc., January, 1922, xvi, 29.*

**Climatic Treatment of Early Phthisis.**—In order to obtain information of what is the best climate for the tuberculous, the cases should be selected, choosing early ones; they should be described and classified, the diagnosis verified by the discovery of tubercle bacilli; treatment must be carried out, each case being followed for a fixed number of years and the results reported. The inquiry should be restricted to early cases, in well-to-do persons, with tubercle bacilli in the sputum. A comparison of results at high altitudes such as Davos and Arosa should be made with results obtained at ordinary levels, and a comparison of results at home sanatoria in different situations. A very large number of cases will need to be accumulated.—*The Climatic Treatment of Early Phthisis in Well-to-do Persons, W. Gordon, Practitioner, December 1921, cvii, 403.*

**Thoracoplasty for Pulmonary Tuberculosis.**—Failure to obtain favorable results from thoracoplastic operations for pulmonary tuberculosis in the early days was probably due to several factors: (1) the removal of almost all the ribs on one side meant a bloody operation with accompanying shock that many patients could not survive; (2) the removal of practically one side of the chest wall resulted in an upset of the normal respiration, with so called mediastinal flutter, which in some cases resulted fatally in a short time. The Friedrich operation, greatly modified by Sauerbruch, has been generally adopted. In America interest in the operation has lately been renewed because of the wider use of artificial pneumothorax and the latter's failure in about 25 per cent of otherwise promising cases because of adhesions. Between 1912 and 1914 three cases were observed following the Wilms operation of the six upper ribs; one of these resulted brilliantly. Ether anesthesia, now believed to be contraindicated, was used. Four case reports are presented showing the results of more recent experience. In 2 the results were satisfactory after fourteen months' observation, as shown by decrease in local and constitutional symptoms and the ability to exercise. The other 2 patients died. In 1 it was believed that the disease was too far advanced and operation was done only at the patient's insistence; she died nine

weeks later from cardiac incompetence. In these 3 patients a modified Sauerbruch operation was done, resecting each rib from the first to the ninth, inclusive, removing from 6 to 8 inches of the upper ribs and being careful to get as large a section as possible from the first and second ribs. Each operation was performed at one sitting and gas-oxygen anesthesia was used. In the third patient, because of his weak heart, only the lower seven ribs were resected, expecting to resect the upper three later. In this way it was hoped to lessen the shock, but the patient developed dropsy and died of a weakened heart. The results in the two successful cases are shown in reproductions of roentgenograms. The operation is to be considered only after the induction of artificial pneumothorax is found impossible. Then the indications are practically those of that operation with the following limitations: The patient must be in better general health than would be necessary with artificial pneumothorax, as the shock of operation is considerable and a good heart and a fairly good uncollapsed or working lung is essential. Saugman believes that a single operation is as well tolerated by the patient as a two-stage operation. Gas-oxygen is the only general anesthetic to be considered, but in many cases local anesthesia is preferable. Careful elevation of the periosteum before resecting the ribs, to permit bone regeneration, is evidently desirable. It may be necessary to resect the first and second ribs in front, better to collapse the lung apex and, for this, the procedure of Archibald of Montreal is probably the best. The presence of fine râles in the collapsed lung may be explained on the basis of incomplete healing and atelectasis. *Conclusions:* Since it is the internist who best appreciates the dangers of operation and its effects, immediate and ultimate, he should be consulted at every step from anesthetic to after-treatment. Friedrich, the surgeon, not only accepted Brauer's suggestions in devising his operation, but operated only after considerable insistence on the part of the latter.—*A Report on Four Recent Cases of Thoracoplasty, A. G. Shortle and W. A. Gekler, J. Am. M. Ass., January 21, 1922, lxxviii, 168.*

**Extrapleural Pneumolysis for Pulmonary Tuberculosis.**—The technique employed by the author is as follows: With chloroform-oxygen anesthesia under positive pressure, a 15 cm. long incision is made in the flank, running parallel with the seventh intercostal space, in the neighborhood of the lower border of the lung. Through this incision the lung is detached from the diaphragm, the line of cleavage being between the two pleural surfaces. In some cases the adhesions are too dense to permit this separation. Small lacerations of the lung tissue are sutured and no ill effects have been seen. The lung is detached from the ribs so that the costal pleural is left adherent to the lung and injury to subpleural caseous foci or cavities are avoided. The blunt detachment is effected first by a small raspatory and later by a Sauerbruch's giant raspatory; finally, the hand is introduced and the lung is completely detached, except where it is adherent to the manubrium and the spinal column. Care is taken to remove the escaped blood. In closing the incision the rib above and the rib below the wound are drawn together by three bronze ligatures; the soft tissues are sutured in turn. The patients usually stand the operation quite well. In two cases sepsis developed later. The operation saves the patient from external deformities but it possesses two dangers: the lung, detached from the chest wall by the operation, may again expand and become adherent to the surrounding structures; and the field of operation may become infected from within or without. The operation may be permissible when the patient prefers it to the mutilating plastic operations or when special conditions, such as very large cavities, suggest that complete collpase of the lung can probably not be achieved by a thoracoplastic operation.—*Extrapleural Pneumolysis, H. Ulrici, Tubercle, 1922, iii, 162.*

**Decortication of Lung for Empyema.**—Personal experience has led Lenormant to the belief that the results of decortication are superior to those of thoracoplasty. When no difficulty is encountered in performing the operation, it is sufficient to effect healing, although in certain cases a rib resection is indicated to complete the cure. Decortication should be done early in order that the plane of clevage may be easily recognized. The operation is indicated when the pleural cavity shows no tendency to contract and heal with a simple thoracoplasty.—*A propos de la décortication pulmonaire, Lenormant, Meeting, Société de Chirurgie, November 3, 1921, reported in Le Prog. Méd., November 19, 1921, no. 47, 552.*

**Indications for Artificial Pneumothorax.** —The following types of cases are mentioned as suitable for treatment by artificial pneumothorax: 1. Unilateral cases of pulmonary tuberculosis with symptoms of toxemia which do not show favorable progress after two or three months of rest treatment.

2. Bilateral disease where only apical lesion without breaking down of lung tissue is present. 3. Cases of severe hemorrhage with limited signs of pulmonary lesion. 4. Cases from which pleural exudates are withdrawn should have their pleural cavities filled with air to prevent the formation of adhesions. The results in all such cases have been uniformly good; in no case did empyema follow pneumothorax treatment.—*Ueber Pneumothoraxbehandlung, J. Neumayer, Münch. med. Wchnschr., October 28, 1921, lxviii, 1387.*

**Observations on 102 Artificial Pneumothorax Cases.**—In 39 cases with successful collapse and treatment for more than two years there were 27 deaths. Twelve are alive and of these, 8 (20 per cent) were so improved that they may be considered healed. Of 44 cases with successful collapse, during the years 1918–1920, 12 have died and of the 32 living, 23 were materially improved. Exudates did not enhance the pneumothorax. Large exudates with membrane formation work directly opposite to to the ideal for pneumothorax, since they prevent proper expansion and full return of function of the diseased lung. Blotchy shadows in the hilum region of the healthy lung in roentgen examinations indicates caution. Florid tuberculosis, even caseous pneumonias if confined to a lobe, are no absolute contraindications to the use of pueumothorax. Among the contraindications toxic conditions deserve especial attention. In cases that subjectively and objectively rapidly improve under pneumothorax therapy, an attempt should be made within a year to allow reëxpansion of the lung, but in other cases that do not so rapidly recover the collapse should be maintained for a long period of time.—*Beobachtungen an 102 Pneumothoraxfällen, H. Deist, Beitr. z. Klin. d. Tuberk., January 10, 1921, xlvi, 342.*

**Pleuritic Exudate on the Healthy Lung Side during Treatment with Artificial Pneumothorax.**—Brauer and Spengler maintain that a pleuritic exudate on the healthy lung side after artificial pneumothorax treatment is exceptionally rare. The case reported occurred in a student, twenty years of age, who developed acute phthisis of the right upper lobe with fever, following an attack of influenza. Artificial pneumothorax was tolerated poorly by the patient, and it was discontinued because the compression was not attainable on account of adhesions. During the pneumothorax treatment a small marginal exudate developed on the diseased side. Thirteen days after the last filling with gas a slight exudate occurred on the left side, which had previously proved to be healthy, roentgenologically and by auscultation and percussion, and finally resorbed after two and a half months. It is believed that the left-sided exudate, as also the right-sided one, was of a tuberculous nature and was occasioned by the pneumothorax treatment. The case finally ran a favorable course without further treatment. A cavity formed, fever and expectoration finally disappeared, the patient gained 4.5 kg. in weight and has returned to his studies.—*Ein Fall von pleuritschen Exudat auf der gesunden Lungenseite bei Behandlung der Kranken mit künstlichem Pneumothorax, H. Zemmin, Beitr. z. Klin. d. Tuberk., April 11, 1921, xlvii, 169.*

**Effect of Pneumothorax Treatment of Tuberculosis on Antibodies.**—In studying the antibodies in the serum of tuberculous patients, it was found that there is a considerable diminution in these elements when artificial pneumothorax treatment is instituted. In six cases, followed systematically, the reduction or disappearance of antibodies was quite characteristic and corresponded to the favorable course of the disease. In the seventh case the antibodies persisted and increased, explained by an extension of the disease to the other lung. These observations favor intervention with pneumothorax when the tuberculosis is well limited.—*Diminution des anticorps tuberculeux dans le sérum après le pneumothorax artificiel, Armand-Delille, Hillemand and Lestocquoy, Meeting, Académie de Médicine, November 8, 1921, reported in Le Prog. Méd., November 19, 1921, no. 47, 550.*

**Pleural Shock in Artificial Pneumothorax.**—A case of pleural shock during the primary institution of artificial pneumothorax is reported. Gas embolism could be definitely excluded by the presence of manometer excursions and the lack of any local cerebral symptoms. Three hundred cubic centimetres of air were given with manometer excursions of −6 to −1 and no disturbance whatever was noted. Following rapid insufflation of an additional 900 cc. of air the patient showed oppression, intense slowing of respiration with increase in depth and prolonged respiratory intervals. The face was pale and moist, but not cyanotic; the pulse went down to 34, but became normal after a few minutes. The systolic blood presssure taken soon after the manifestation of the first symptoms was 105, later 120. The rapid change in the intrapleural pressure with traction on the hilum and irritation of the pneumogastric nerve

are looked upon as the cause of the above accident.—*Zur Frage des Pleurashocks beim künstlichen Pneumothorax, Unverricht, Deutsch. med. Wchnschr., September 1, 1921, xlvii, 1029.*

**Treatment of Pulmonary Tuberculosis by Intrapleural Infusions of Saline Solution.**—In 4 cases of comparatively advanced tuberculosis physiological saline solution was given intrapleurally. Marked improvement was noted in 3 cases, in which the increase in weight and appetite, and the disappearance of the catarrhal symptoms were striking. The fourth case died six days after the treatment, and autopsy revealed caseous pneumonia with cavities and extensive adhesions.—*Über die Behandlung der Lungentuberkulose mit intrapleuraler Infusion, Thinius, Deutsch. med. Wchnschr., October, 27, 1921, xlvii, 1293.*

**Treatment of Intercurrent Colds in Pulmonary Tuberculosis with Bretschneider's Alternating Hot and Cold Air Apparatus.**—Good results were obtained in consumptives suffering from acute intercurrent colds, with the Bretschneider alternating hot and cold air apparatus. The apparatus consists of an upper round chamber containing ice, through which the inhaled air is passed, the usual temperature being 5–10°C. read from a thermometer attached, and a lower round chamber containing water and heated by an alcohol burner to the boiling point, the temperature of the warm air being 55–65°C. read from a second thermometer projecting into this chamber. The patients inhale the air through suitable nose and mouth tubes connected with the apparatus by rubber tubing. Inhalations are given twice daily, at morning and evening, for one-half hour. In nasal inhalation the air is expired through the mouth, and in mouth inhalation the air is expired through the mouth after removing the mouth piece following each inhalation. Four inhalations of warm air are followed by four of cold air, and repeated. The treatment has also proved to be a valuable prophylactic measure. In mild cases of tuberculosis favorable results were obtained upon the tuberculosis itself, although further observations on this point seem desirable. Good results were also obtained in bronchial asthma and hay fever.—*Behandlung interkurrenter Erkältungskrankheiten bei Lungentuberkulose mit dem Bretschneiderschen Wechselatmungsapparat, E. Lange, Beitr. z. Klin. d. Tuberk., January 10, 1921, xlvi, 273.*

**Treatment of Surgical Tuberculosis with Heliotherapy.**—A series of cases of surgical tuberculosis had been treated with sunlight ten to fifteen years previously by Rollier in Leysin and these he had gradually allowed to return to work. Many of these patients had come to Switzerland as hopeless cases and they have now been able to carry on really severe manual labor for many years.—*Resultats eloignes du traitement des tuberculoses externes par l'heliotherapie, C. Cazin, Soc. de Med. de Paris, 1921, i, 14.*

**Heliotherapy in Surgical Tuberculosis.**—Sunlight treatment is highly recommended for surgical tuberculosis of every type and at every age. It can be carried out not only in high altitudes but also in the lowlands and at the sea. However, one must treat such cases for many months, varying from five to twenty months or even more. The patients were treated in Arona at an altitude of 216 metres. They were twenty-five in number and all showed good results. The technique of Rollier was carefully adhered to.—*Elioterapia e tubercolosi chirurgiche, L. Negri, Il Policlinico, Sez. Chir., 1920, no. 10, 11.*

**Vienna Lupus Institute.**—This institute was established in 1913. It contains special rooms for the treatment of diseases of mucous membranes, eye, nose, larynx and ears, as well as various laboratories and photographic outfits, X-ray departments, operating theatre, three mercury quartz lamps and a room for radium treatment. It accommodates 80 to 100 adult patients, including 100 children. Ample arrangements for baths are made. There is a roof garden adapted for open-air treatment combined with constant sunlight exposures as in Switzerland. Patients to the number of 5825 applied for treatment. Thirty-one hundred cases of lupus were treated. Six-hundred and thirty-nine hopeless cases were treated with plastic operations. The remainder were subjected to X-ray treatment (36 per cent), radium (20 per cent), uviol lamp (6 per cent), Finsen light (15 per cent), while others were treated with high frequency current, artificial sunlight and diathermy. Lupus required sittings of sixty to eighty minutes. Plastic operations were the quickest methods of cure. Experience seemed to show that tuberculosis of the skin begins in the first years of life in more than three per cent, but if the first five years are considered it occurs in nineteen per cent. From the forty-eighth year on, the beginning of the disease seems to be rather an exception. Occupation does not seem to play a part.—*The Vienna Lupus Institute, Jour. Amer. Med. Assoc., November, 1921, lxxvii, 1589.*

**Finsen Treatment of Lupus.**—The author demonstrates that similar excellent results can be obtained in the treatment of lupus by carrying out in France the same methods that were employed at the Finsen Institute; however, in cases that have developed many scars or have very widespread disease, the results are not favorable.—*Traitement du lupus par la Finsentherapie, L. Bizard, Bull. de la soc. franc. de dermatolog. et de syphilograph., 1921, no. 4, 138.*

**Sunlight Treatment After Operation for Genital Tuberculosis.**—Two patients with tuberculosis of the adnexa after operation had persistent sinuses. These, when followed up with sunlight treatment, showed excellent healing. Cases of widespread tuberculous changes should be treated with sunlight radiations, especially as a postoperative means. In these cases residues will be prevented.—*L'héliothérapie après les opérations pour tuberculose génitale, A. Aimes, Gynécologie, 1921, no. 3, 145.*

**New Apparatus for Radiating the Larynx with Sunlight.**—This consists of a speculum attached to a tube which can be put into the mouth. At its inner opening a laryngeal mirror is placed which can be regulated by the patient by observation through two outside mirrors. The apparatus maintains itself in place so that the hands are not necessarily employed to hold it.—*Ein neuer Apparat zur Kehlkopfbestrahlung, L. Jonas, Wien. klin. Wchnschr. 1921, no. 23. 280.*

**Climatic and Sunlight Treatment of Surgical Tuberculosis.**—One thousand cases were treated with direct sunlight exposures. A particular advantage of this treatment is the shortening of the period of handling and the lessened need for operative measures. In the order of their value are the high altitude sunlight of the Alps, sub-Alpine sunlight, lowland sunlight and artificial sunlight (the quartz lamp). Brilliant results were obtained with total sunlight, employing according to Rollier's technique graduated exposures under careful watching, so that eventually eight hours' radiation were given. Operative measures were at times carried out, especially for the opening up of suppurating lymph nodes and cold abscesses, the liberation of sequestra, the resection of joints or kidney extirpation. Together with this, tincture of iodine, iodoform, iron, arsenic, creosote and other drugs were employed.—*The Climatic and Sunlight Treatment of Surgical Tuberculosis, O. Bernhard, Tubercle, 1921, ii, 490.*

**Heliotherapy in Surgical Tuberculosis.**—Fixation of tuberculous joints should be avoided whenever certain other measures can be applied to avoid the danger of ankylosis. Not fixation, but rest and removal of the load make for a functional cure. Heliotherapy has the advantage that it cures not only the disease focus, but benefits at the same time the entire body. Where there is tuberculosis of the extremities with that of the cervical glands, a combination of heliotherapy with passive congestion is of decided benefit. Owing to its beneficial effect upon the tuberculous process, internal administration of iodine must not be lost sight of. Since the therapeutic value of heliotherapy rests, not upon the presence of ultraviolet, but upon heat rays, it is necessary that an apparatus for artificial heliotherapy emits the red and infrared heat rays.—*Sonnenbehandlung der sogenannten chirurgischen Tuberkulose, Kisch, Ztschr. f. Tuberk., October, 1921, xxxiv, 648.*

**Light Treatment of Surgical Tuberculosis.**—Five hundred and thirty-one cases of surgical tuberculosis have been treated by the author at the Finsen Institute with carbon arc irradiations during the last seven years. Three-hundred and seventy-five of these cases were complicated with fistulae and abscesses. The results were very encouraging, 80 per cent healing if uncomplicated, and 83 per cent even with complications. During the past the author has more regularly employed sunlight but more particularly for children and in cases of milder disease. With 45 of these cases, of which 27 had complications, all showed healing. In conclusion, indications for light treatment are offered.—*Lichtbehandlung bei chirurgischer Tuberkulose, N. P. Ernst, Hospitalstidende, 1921, lxiv, nos. 4 and 9, 11, 17.*

**X-Ray Treatment of Pulmonary Tuberculosis.**—In order to test Kupferle and Bacmeister's experiments, rabbits of equal weight and race were infected subcutaneously or intravenously with small doses of bovine tubercle bacilli. Radiation was given to the animals in small, medium and large doses. Simultaneously with these experiments, patients with pulmlnary tuberculosis were submitted to local X-ray treatment. The first group comprised 8 rabbits: two were given 0.1 mgm. of bovine bacilli subcutaneously; two, 0.05 mgm. intravenously; while four served as controls. In the rabbits infected subcutaneously the site of infection as well as the enlarging nodes were rayed; in those infected intravenously radiation of the right and left halves of the thorax was done. The first two

animals received together 72X according to Kienböck; of the second group the first animal had 18, the second 36X. The period of life in the first group was slightly longer than in the controls, the reverse being the case with the second group. The radiated animals lost considerably more in weight than the controls. The macroscopic findings, disclosed postmortem in the treated rabbits, did not visibly differ from the controls. Caseous nodules of millet to pea size filled the lung, while isolated tubercles in the kidneys, liver, omentum, and serosa were found. At the site of infection small, hard nodes of bean size were detected. In two other animals, also infected subcutaneously with 0.1 mgm. of the same strain and treated locally at intervals of eight days with 1 H.E.D. (both animals together received 117X), the duration of life was equal to that of the controls, while the latter lost more in weight. The last series of 8 rabbits was given only 0.05 mgm. subcutaneously and was divided in four groups. Radiations were started in the first group 8 days, in the second 15 days, and in the third 4 weeks after the infection. The fourth group contained the controls. The animals of group 1 always received a large dose (H.E.D.=25X); those of the second group, 0.6 H.E.D. The total dosage given to animals of group 1 was 313X, 205X, 175X; to those of group 2, 150X, 100X, 90X. The duration of life of animals of group 1 was 83, 90, and 103 days; of group 2, 120, 55, and 73 days; of the controls, 99 and 80 days. The loss of weight in the treated rabbits ranged between 600 and 900 gm.; in the controls between 400 and 1150 gm. The treated and nontreated rabbits showed no difference as to the macroscopic findings in the internal organs. Important changes were noted in the lymph nodes at the site of infection. Rabbits treated with large doses showed scar formation and the nodes were small and hard and had much thickened capsules. The site of infection in those treated with small doses showed partly caseated infiltrations, while the controls presented large, extensively caseated nodes of prune size. The extent of tuberculosis in the internal organs was found to be the same in the treated animals and controls on microscopic examination, while marked transformation of the granulations into connective tissue was noted in the local nodes at the site of inoculation. The patients selected for X-ray treatment were unilateral cirrhotic cases with small cavities in the upper lobe, which had not yielded to the usual methods of treatment. Of the 11 cases, 3 had a partial artificial pneumothorax, 3 very slight involvement of the larynx, 5 subfebrile temperature and 10 tubercle bacilli in the sputum. The involved areas were exposed to doses of 0.6 to 1 H.E.D. at intervals of 2 to 3 weeks. All in all, 50 to 250X, and in most cases 100 to 190X were applied. Shrinkage of the lesions seemed to be stimulated by this treatment, but the number of bacilli in the sputum was not changed. Three cases lost their fever, while in 5 a temporary aggravation with increased expectoration, more bacilli and fever occurred. In one case liquefaction of the tuberculous tissue developed which could not be arrested by institution of pneumothorax and resulted in death. Of the remaining patients one was discharged as relatively cured, 4 as markedly improved, 4 slightly improved, and 2 unimproved. Three years later the relatively cured case was found to be completely cured and capable of work. In another case the marked improvement remained permanent. In 6 cases exacerbations with activity of the foci at varying intervals occurred. Owing to the danger of liquefaction in exudative pneumonic processes, which cannot be definitely excluded small, stimulating doses are recommended. Favorable results were obtained in tracheobronchial tuberculosis with intact lungs or inactive foci. The radiations were applied parasternally and paravertebrally at intervals of 8 to 14 days. Improvement of the clinical symptoms as well as disappearance of the nodes were observed. In a few cases of asthma due to an old inactive tuberculosis the administration of X-ray treatment over the tracheobronchial nodes resulted in improvement.—*Zur Behandlung der Lungentuberkulose mit Röntgentsrahlen, G. Schroeder, Deutsch. med. Wchnschr., November 10, 1921, xlvii, 1353.*

**X-ray Treatment of Surgical Tuberculosis.**—Literature since 1913 is completely reviewed showing applications of the old and new dosages of X-ray. The treatment is most promising. Best results are obtained in lymph node tuberculosis. The duration of exposures amounts to several months and in severe cases up to one year. Exposure is made every four weeks and after three treatments there is an interval of three months. The results are not as favorable in the larger bone and joint affections as in the smaller ones. Combinations of X-ray with artificial light baths are also recommended. Peritoneal tuberculosis as well as synovial disease responds favorably.—*Über Röntgenbehandlung von chirurgischer Tuberkulose, T. Eiken, Hospitalstidende, 1920, no. 24, 212.*

**X-ray Treatment of Pulmonary Tuberculosis.**—The author has for seven years treated cases of tuberculosis with excellent results. The technique consists of irradiations three times a week, alternating exposures on the chest and back with five milliamperes at a distance of 37 cm. with a 3 mm. aluminum filter. The exposure is three to six minutes in accordance with the temperature reaction of the patient, which should always be carefully controlled and never allowed to rise high.—*X-ray Treatment of Pulmonary Tuberculosis, W. Wilkinson, Amer. Jour. Roentgenol. 1921, viii, 241.*

**X-ray Treatment of Pulmonary and Tracheobronchial Node Tuberculosis.**—The definite value of the X-rays in the treatment of so called surgical tuberculosis is an established fact. Its value in tuberculosis of the lungs is still problematical and its application should be controlled with the greatest care. Often definite improvement is noted in involvement of the peribronchial lymph nodes.—*Die Bedeutung der Röntgenstrahlen für die Diagnose und Behandlung der Lungentuberkulose, F. Jessen, Ztschr. f. Tuberk., October, 1921, xxxv, 95.*

**Eruption of Lupus of Breast and Arm, Due to Light.**—The patient was a woman of forty-two years with lupus erythematosis of the face. During exposures with general carbon arc light baths, which ordinarily have a very favorable healing effect upon these lesions, a new rash appeared on the chest and upper arm with bullae, which was of a character similar to that on the face. This is the first report of a lesion of this character which has been produced by artificial light.—*Lupus Erythemalodes an Brust und Oberarm, von Kohlenbogenlichtbädern, C. With, Forhandl. v. nord. dermatolog. Forening's, 4 Sitzg, Kopenhagen, 1921, 130.*

**Treatment of Tuberculosis of Children with Quartz Light.**—Thirty cases of lymph node tuberculosis, 14 of wet pleurisy and 21 of exudative and adhesive peritonitis, all between the ages of two and fifteen years, were treated with the quartz lamp. The favorable results manifested themselves first in general betterment, but only after six to ten months were the nodes favorably influenced. As a supporting measure for surgical treatment, fistulae and wounds healed well with radiations after excision of nodes. Excellent results were had in tuberculosis of the mesenteric nodes after laparotomy. Wet pleurisy healed after short periods of radiation. Forty to fifty exposures were sufficient in 12 cases. Serous peritonitis healed completely after sixty to seventy exposures, and adhesive types after thirty to thirty-five exposures. Pulmonary tuberculosis with signs of ulceration was not suited for treatment. The dosage used was five minutes' initial exposure at a distance of one metre, followed by a gradual increase of three minutes daily, until thirty minutes were reached, and then a decrease of the distance down to 25 cm. Fever was lost during the radiations.—*Behandlung der Kindertuberkulose mit der Qurzlampe, A. Mulierowna, Pediatr. Polska, 1921, ii, 53.*

**Study of Catalytic Action of Light.**—Extensive experiments upon biochemical actions, such as those occurring during hemolysis of red blood cells (in test tubes) due to light in the presence of fluorescent substances (eosin) have led the authors to interesting observations. The liberation of hemoglobin does not depend upon osmosis, such as was formerly considered, but upon changes occurring in albumin. This furthermore depends upon the increased ability of the protein bodies to be broken down through $CO_2$ and $(NH_4)_2SO_4$ in the formation from methemoglobin.—*Zur Kentniss lichtkatalytischer Wirkungen, H. Pfeiffer and G. Bayer, Ztschr. f. d. ges. exp. Med., 1921, xiv, 137.*

**Nutritional Treatment of Tuberculosis.**—Tuberculosis is a nutritional disease, in the sense that the germs of the disease which are contained in the body of practically every adult inhabitant of a city are not allowed to spread and to overwhelm the body, so long as this is in a good state of nutrition. The power of the cells to produce antibodies depends on a certain excess of food. There is no specific agent available; but a good appetite, satisfied with ample meals, is the best preventive and the best cure. In the past all cures have culminated in the therapy of feeding. Changes of location and physical stimulants may be abandoned, if a definite amount of food is prescribed and if the patients are ordered to take an open air cure combined with suitable rest intervals. In the large station for 100 children on the roof of the author's clinic in Vienna these principles have been successfully applied. Here the most important function of the day is eating, not a certain kind of food, but a certain quantity. Diagnosis is accomplished with the aid of a skin test and an X-ray picture. If home conditions are favorable, an individual prescription for food is given. The patient's height and weight are taken, to determine how many kilograms he is underweight and whether his height corresponds to his age. From his sitting height his *pelidisi* is calcu-

lated, comparing it on a table with his weight. In this way the deviation from normal weight can be ascertained. His food requirement is then calculated in *decinem siqua*. (According to the Pirquet system, one gram of mother's milk equals one *nem* and all food requirements are calculated in terms of this unit; one *decinem* equals one-tenth *nem*. The *siqua* is sitting height in centimetres, squared.) Allowance is made for muscular movements, and gain in length and weight. The diet is divided into five portions and served at three-hourly intervals starting at six or seven o'clock A. M. The largest meal is given at noon. The protein fraction is adjusted between a maximum of twenty per cent and a minimum of ten per cent of the total food. The feeding cure is combined with rest in bed for the first two weeks. After this the child is allowed out of bed for gradually increasing periods, starting at half an hour, morning and afternoon. Changes in diet are indicated by the weight recorded once a week. In a ward, containing children affected with slight tuberculosis and convalescents from an acute attack of tuberculosis, nutrition classes are formed. The children are divided into groups according to their sitting height and each group is put at a separate table. The food is distributed by means of a graduated dipper or a balance and bread and cakes are sliced into *hektonem* portions. Each child is required to eat all that is served him and the daily schedule is strictly adhered to. The results of this system have been satisfactory and prognosis has consequently become more optimistic. Tuberculin has been abandoned and no specific medical treatment is given. A notable case was that of a boy with a tuberculoma of the brain that was cured by means of this system of treatment. Three tables outline in detail some of the principles of the system.—*Nutritional Treatment of Tuberculosis, C. Pirquet, N. York M. J., February 1, 1922, cxv, 121.*

**Diet in Tuberculosis.**—The tuberculous organism differs from the normal in that it is able to lay up nitrogen, like the convalescent organism in general. This desirable result is best attained by feeding a light surplus of all the food stuffs. The superalimentation practised in many sanatoria, however, where 6000–7000 calories per day are given, is to be condemned. The author finds about 3000 calories per day desirable, distributed as follows: protein 90 to 100 grams, fats 80 grams, carbohydrate 500 grams. Care should be taken that the protein is qualitatively of the right type, including an abundance of the indispensable amino acids, tryptophane, tyrosine, cystine and the diamino acids. It is desirable also that more than sufficient mineral, particularly calcium, be supplied. It is well to recall that some substances, high in nutritive value, like meat, are low in mineral content. On the other hand, such mineral-rich substances as green vegetables, tubers and fruits, may be low in food value. An abundance of vitamines must be given. Some sample diets are given in the test.—*Le régime des tuberculeux d'après les nouvelles données alimentaires, A. Cawadias, Presse Méd., November 26, 1921, no. 95, 938.*

**Intracutaneous Vaccination with Bovine and Human Tuberculin.**—In 26 cases of manifest pulmonary tuberculosis in both sexes, vaccinated intracutaneously with bovine and human tuberculin, it was found that in 79 per cent of the cases the bovine gave stronger reactions than the human, in 15 per cent weaker, and in 3 per cent of equal strength.—*Intrakutanreaktion mit Typus bovinus und Typus humanus, A. Strubell, Centralbl. f. inn. Med., January 8, 1921, xlii, 2.*

**Immunizing and Healing Effects of Non-Pathogenic Acid-Fast Bacilli.**—Neither with Moeller's blindworm nor with Friedmann's turtle bacilli can an immunization to human or bovine tuberculosis be produced in guinea pigs or rabbits. The action of the acid-fast bacilli was at first studied in sheep infected with bovine bacilli of moderate virulence; 3 sheep previously negative to 0.5 cc. of O. T. received subcutaneously 5 mgm. of a five-week old glycerine-agar bovine culture; 15 days later one sheep was given 50 mgm. of Friedmann's, another the same amount of Moeller's bacilli, while the third served as a control. The control animal developed less tuberculosis than the other two sheep: the Friedmann treated animal had the most extensive process. In 4 rabbits treated with Moeller's bacilli two months old prior to infection with human bacilli, fatal issue resulted earlier than in the controls; 4 guinea pigs, immunized by 4 injections with Friedmann's bacilli before the infection, died sooner than the controls. In 2 guinea pigs, immunized by one large dose of turtle bacilli, death occurred 27 and 142 days later than in the controls; 4 guinea pigs immunized by 4 large doses (225–300 mgm.) of turtle bacilli and infected three months later died earlier than the controls.—*Immunisierungs und Heilwirkungen säurefester Stäbchen (Moeller, Friedmann) gegen die Tuberkulose von Versuchstieren, M. Kirchner, Deutsch. med. Wchnschr., February 17, 1921, xlvii, 174.*